

INITIAL TITLE V AIR PERMIT APPLICATION REVIEW

DRAFT

APPLICANT: DAK Monomers, LLC	SITE LOCATION: Leland	COUNTY: Brunswick	
TECHNICAL CONTACT: Penny Mahoney	PHONE: 910-371-5232	RESPONSIBLE OFFICIAL: Leroy Butler	TITLE: Plant Manager
REVIEW ENGINEER: Michael Brandon	SIGNATURE:	DATE: September 3, 2003	
REGIONAL CONTACT: Dean Carroll	REGIONAL OFFICE: Wilmington	SIC CODE: 2824	
APPLICATION NUMBER: 100013A5.A	EXISTING PERMIT NUMBER: 03033R31	NEW PERMIT NUMBER: 03033T32	

I. Introduction

The U.S. Environmental Protection Agency (EPA) has given full approval to North Carolina's Title V operating permits program effective on October 1, 2001. The EPA interim approval of December 15, 1995 triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This Initial Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the Title V operating permit. The primary source of information used to construct the permit is the above referenced air permit application.

II. Background Information

The Title V operating permit replaces an existing Air Quality Construction and Operation Permit No. 03033R31 which was issued on August 6, 2003 and is currently scheduled to expire on August 31, 2006.

Pursuant to 15A NCAC 2Q .0506, DAK Monomers, LLC submitted its initial Title V application to the Division of Air Quality on June 20, 1996 as Dupont, Cape Fear Plant. The application was considered complete for processing on August 21, 1996. The application was subsequently updated to incorporate facility changes and new MACT requirements on July 25, 2003 to address MACT subpart JJJ applicability issues and changes to MACT HON applicability. The permit will be required to go to public notice pursuant to 15A NCAC 2Q .0521. The proposed permit is also required to undergo a non parallel EPA review period commencing after the public notice period.

III. Facility Description

DAK Monomers, LLC produces terephthalic acid (TPA) using the acetic acid process and polyethylene terephthalate (PET) using both TPA and dimethyl terephthalate (DMT) which is purchased off site. TPA is sold to outside users as well as being used on site for the production of bottle resin using a three step polymerization process (prepolymerization, finish polymerization, and solid state polymerization) and staple resin using a two step process (prepolymerization and finish polymerization). DAK Monomers also produces acetic acid and methanol from methyl acetate. Methanol is shipped off and is not used on site as the company no longer produces DMT.

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. The facility is apparently not providing the monitoring, recordkeeping and reporting required by MACT for affected facilities subject to JJJ and HON. The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the

facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

V. Summary of Emission Sources and Control Devices

The following table contains a summary of all permitted emission sources and associated air pollution control devices and appurtenances:

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
INTERMEDIATES AREA TPA Line No. 1			
A11OX1 A11OX2 A11OX3 all affected sources subject to NSPS III TOC TRE > 1 and MACT F,G HAP TRE = 7	air oxidation reactor air oxidation reactor air oxidation reactor ----- Absorber first stage bottoms (acetic acid) is transferred to the bottoms stripper column (ID No. A42BSCS) for acetic acid recovery. Absorber second stage water is transferred to Line No. 1 acetic acid recovery operations (ID No. A13AARS) as a recovery stream.	RDA11 MACT F,G pv2 RDA11 may vent to control devices consisting of catalytic oxidizer (ID No. CDA45) and packed bed scrubber (ID No. CDA46), combusted in the TPA incinerator (ID No. P21), or vented to the atmosphere via the expander vent or TPA silos as transport air.	Recovery Device Line No. 1 first stage high pressure valve tray absorber; minimum of 20,000 pounds per hour of acetic acid injection venting to second stage high pressure valve tray absorber; 4,100 pounds per hour of water injection.
C11CRY1 C11CRY2 C11CRY3 C11CRY4 all affected sources subject to MACT F,G	crystallizer crystallizer crystallizer crystallizer ----- Absorber water is transferred to Line No. 1 acetic acid recovery operations (ID No. A13AARS) as a recovery stream.	RDC11 MACT F,G pv2	Recover Device packed bed absorber; 385 gallons per minute water injection. TRE=57 ----- Absorber vapor stream may be vented to heat recover fume abator (ID No. CD43) and packed bed scrubber (ID No. CDA44).

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
<p>A13FMD MACT H</p> <p>A13FSMLD MACT F,G</p> <p>A13HCSFR A13HCST</p> <p>A13SSKP A13 ROVAC A13RFT A13TCF A13CRTCF</p> <p>A13DRY MACT F,G</p> <p>A13CRT1 A13CRT2 A13CRT3 A13CRC1 A13CRC2</p> <p>A13SCD</p> <p>A13DSD</p> <p>A13AARS MACT F,G</p> <p>A13T</p>	<p>feed mix drum for air oxidation reactors</p> <p>FIRST STAGE SEPARATIONS mother liquor drum, centrifuges, reslurry drum</p> <p>HYDROCLONE SYSTEM Filtrate receiver, five hydroclones Slurry tank</p> <p>SECOND STAGE SEPARATIONS knockout pot for Rovac filter system Rovac filter system Rovac filtrate tank with condenser three centrifuges centrate receiver for three centrifuges</p> <p>DRYING OPERATIONS TPA dryer with primary scrubber (ID No. CDA13DRYSCRB)</p> <p>CATALYST RECOVERY catalyst recovery tank catalyst recovery tank catalyst recovery tank catalyst recovery centrifuge catalyst recovery centrifuge</p> <p>ACETIC ACID SOLVENT RECOVERY Solvent charge drum for acetic acid recovery system. Dehydration solvent drum (acetic acid dehydration tower bottoms receiver). Stripper still pot, stripper bottoms hold tank, solvent stripper/dehydration tower venting to tower reflux condensate drum.</p> <p>TPA HANDLING rework/rewash mix tank</p> <p>----- Absorber water is transferred to Line No. 1 acetic acid recovery operations (ID No. A13AARS) as a recovery stream.</p>	<p>RDA13 MACT F,G pv2</p>	<p>Recovery Device TRE=44 Line No. 1 packed bed absorber first stage; minimum of 3,500 pounds per hour of acetic acid injection venting to packed bed absorber second stage; 1,750 pounds per hour of water injection</p> <p>----- Absorber vapor stream may be vented to heat recover fume abator (ID No. CD43) and packed bed scrubber (ID No. CDA44).</p>
<p>TPA1LUWA</p>	<p>residue evaporator handling acetic acid recovery stripper bottoms</p>	<p>P21</p>	<p>TPA Incinerator</p>

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
INTERMEDIATES AREA TPA Line No. 2			
A21OX1 A21OX2 A21OX3 all affected sources subject to NSPS III TOC TRE > 1 and MACT F,G HAP TRE = 7	air oxidation reactor air oxidation reactor air oxidation reactor ----- Absorber first stage bottoms (acetic acid) is transferred to the bottoms stripper column (ID No. A42BSCS) for acetic acid recovery. Absorber second stage water is transferred to the Line 2 acetic acid recovery system (ID No. A23AARS) for acetic acid recovery.	RDA21 MACT F,G pv2 RDA21 may vent to control devices consisting of catalytic oxidizer (ID No. CDA45) and packed bed scrubber (ID No. CDA46), combusted in the TPA incinerator (ID No. P21), or vented to the atmosphere via the expander vent or TPA silos as transport air.	Recovery Device Line No. 1 first stage high pressure valve tray absorber; minimum of 20,000 pounds per hour of acetic acid injection venting to second stage high pressure valve tray absorber; 4,100 pounds per hour of water injection.
C21CRY5 C21CRY6 C21CRY7 C21CRY8 all affected sources subject to MACT F,G	crystallizer crystallizer crystallizer crystallizer ----- Absorber water is transferred to Line No. 2 acetic acid recovery operations (ID No. A23AARS) as a recovery stream.	RDC21 MACT F,G pv2	Recovery Device packed bed absorber; 385 gallons per minute water injection TRE=45 ----- Absorber vapor stream may be vented to heat recover fume abator (ID No. CD43) and packed bed scrubber (ID No. CDA44).

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
<p>A23FMD MACT H</p> <p>A23FSMLD MACT F,G</p> <p>A23HCSFR</p> <p>A23SSKP A23SSFT</p> <p>A23SSFUGES</p> <p>A23DRY MACT F,G</p> <p>A23SCD A23AARS MACT F,G</p> <p>A23AARSB A23RC</p> <p>A23AARDT MACT F,G</p> <p>A23DSD</p> <p>A23BAD</p> <p>A23BAR MACT F,G A23MAP MACT F,G</p>	<p>feed mix drum for air oxidation reactors</p> <p>FIRST STAGE SEPARATIONS mother liquor drum, centrifuges, reslurry drum</p> <p>HYDROCLONE SYSTEM filtrate receiver, slurry tank, hydroclone</p> <p>SECOND SAGE SEPARATIONS Knockout pot for Rovac filter system Filtrate tank receiving emissions from Rovac filter system Three centrifuges [alternative to Rovac receiving emissions from centrate receiver</p> <p>DRYING OPERATIONS east TPA dryer with primary scrubber (ID No. CDA23DRYSCRB)</p> <p>SOLVENT SEPARATIONS SYSTEM Solvent charge drum for solvent separations Stripper still pot, solvent stripper, and solvent stripper condenser.</p> <p>Stripper bottoms hold tank. Stripper bottoms residue concentrator with condenser. Dehydration tower, condenser, and dehydration condensate drum (overheads).</p> <p>Dehydration solvent drum for bottoms from solvent separations dehydration tower</p> <p>BUTYL ACETATE/METHYL ACETATE RECOVERY SYSTEM Butyl acetate decanter with absorber A23DVA for overheads from solvent separations dehydration tower. Butyl acetate recovery column with reflux condenser. Methyl acetate purge column with reflux condenser.</p> <p>Absorber (ID No. RDA23) water is transferred to Line No. 2 acetic acid recovery operations (ID No. A23AARS) as a recovery stream.</p>	<p>RDA23 MACT F,G pv2</p>	<p>Recovery Device TRE=6 Line No. 2 east packed bed absorber; 722 pounds per hour minimum water injection.</p> <p>----- The absorber may vent to the natural gas/propane- fired fume abator (ID No. CDA43) which vents to the packed bed scrubber (ID No. CDA44)</p>

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
<p>A24FSFUGE MACT F,G</p> <p>A24SSKP A24SSFT</p> <p>A24SSFUGES</p> <p>A24DRY MACT F,G</p>	<p>FIRST STAGE SEPARATIONS centrifuge, reslurry drum, centrate level drum</p> <p>SECOND SAGE SEPARATIONS Knockout pot for Rovac filter system Filtrate tank receiving emissions from Rovac filter system Three centrifuges [alternative to Rovac receiving emissions from centrate receiver</p> <p>DRYING OPERATIONS west TPA dryer with primary scrubber (ID No. CDA24DRYSCRB)</p> <p>----- Absorber (ID No. RDA24) water is transferred to Line No. 2 acetic acid recovery operations (ID No. A23AARS) as a recovery stream.</p>	<p>RDA24 MACT F,G pv2</p>	<p>Recovery Device TRE=15 Line No. 2 west packed bed scrubber; 722 pounds per hour minimum water injection</p> <p>----- The absorber may vent to the natural gas/propane-fired fume abator (ID No. CDA43) which vents to the packed bed scrubber (ID No. CDA44)</p>
<p>TPA2LUWA</p>	<p>residue evaporator handling solvent separations stripper bottoms</p>	<p>P21</p>	<p>Incinerator</p>
<p>P22</p>	<p>TPA process waste extruder</p>	<p>CDP22</p>	<p>spray scrubber; 50 to 130 gallons per minute water injection</p>
TEREPHTHALIC ACID HANDLING			
<p>A15</p>	<p>TPA north silo - Line No. 1</p>	<p>CDA15</p>	<p>fabric filter; 707 square feet of filter area</p>
<p>A16</p>	<p>TPA middle silo - Line No. 1</p>	<p>CDA16</p>	<p>fabric filter; 707 square feet of filter area</p>
<p>A16A</p>	<p>TPA truck loading silo - Line No. 1</p>	<p>CDA16A</p>	<p>fabric filter; 172 square feet of filter area</p>
<p>A17</p>	<p>TPA south silo - Line No. 1</p>	<p>CD1A17</p>	<p>fabric filter; 669 square feet of filter area</p>
<p>A25</p>	<p>TPA north silo - Line No. 2</p>	<p>CDA25</p>	<p>fabric filter; 707 square feet of filter area</p>
<p>A26</p>	<p>TPA south silo - Line No. 2 DCO</p>	<p>CDA26</p>	<p>fabric filter; 707 square feet of filter area</p>
<p>A26A</p>	<p>TPA truck loading - Line No. 2</p>	<p>CDA26A</p>	<p>fabric filter; 172 square feet of filter area</p>

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
A32	truck and railcar remote shipping silo	CDA32	fabric filter; 712 square feet of filter area
		CDA32A	fabric filter; 712 square feet of filter area
A33	railcar loading silo	CDA33	fabric filter; 265 square feet of filter area
		CDA33A	fabric filter; 265 square feet of filter area
A34	railcar loading receiver bin	CDA34	fabric filter; 265 square feet of filter area
A35	railcar unloading	CDA35	fabric filter; 213 square feet of filter area
A36	TPA remote truck loading	CDA36	fabric filter; 172 square feet of filter area
A37	TPA receiver bin for railcar and truck loading	CDA37	fabric filter; 712 square feet of filter area
INGREDIENTS RECOVERY			
A41MAST A41MAHR MACT F,G A41AASC MACT F,G A41 MAC MACT F,G A42CVS MACT H	Methyl acetate storage tank Methyl acetate hydrolyzation reactor (acetic acid production/ methanol byproduct) Acetic acid separator column (acetic acid from methyl acetate/methanol/water) Methyl acetate column (methyl acetate from methanol/water) Closed Vent System from Recovery Devices to Control Devices ----- absorber RDA41 water is transferred to the bottoms stripper column (ID No. A42BSCS) as a recovery stream.	RDA41 MACT F,G pv1 CDA43 CDA44 MACT F,Gww1	Recovery Device packed bed absorber; 1,000 pounds per hour minimum water injection venting to Control Devices natural gas/propane-fired fume abator with NSPS Dc heat recovery boiler (10 million Btu per hour heat) venting to packed bed scrubber (12 gallons per minute caustic sulfite solution injection).
MC1 NSPS VV/MACT H NSPS NNN MACT F,G pv2 MACT F,Gww2	Methanol distillation column/reflux condenser (methanol from water) TRE=120 HAP TRE = 2.3 TOC	na	na

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
PR9RMST MACT F,G sv1 PR9DMST MACT F,Gsv1 PR9MLR MACT F,Gto1 PR9DMSR MACT H PR9CVS MACT H	Recovered methanol storage tank; 250,000gal Distilled methanol storage tank; 200,000gal Methanol loading rack PR9 scrubber recirculation tank Closed vent system to control device	CDPR9 MACT F,Gww1	Control Device packed tower scrubber; 550 pounds per minute minimum water injection
A42BSCS MACT F,G A42CVS MACT H	A11, A21, A41, and A42 scrubber bottoms stripper column/reflux condenser (to methyl acetate column) Closed Vent System from Recovery Devices to Control Devices ----- absorber RDA42 water is transferred to the bottoms stripper column above (ID No. A42BSCS) for recovery of A41 constituents (i.e., methyl acetate)	RDA42 MACT F,G pv1 CDA43 CDA44 MACT F,Gww1	Recovery Device packed bed absorber; 7,012 pounds per hour minimum water injection. Control Devices natural gas/propane-fired fume abator with NSPS Dc heat recovery boiler (10 million Btu per hour heat) venting to packed bed scrubber (12 gallons per minute caustic sulfite solution injection).
Direct Coupling Oligomer Area (esterification)			
DC1 MACT JJJ	Slurry (terephthalic acid/ethylene glycol) mix tank; 18,000 gallon capacity	CDDC1	direct contact condenser; 2,000 to 3,000 pounds per hour ethylene glycol injection
DC2 MACT JJJ	Slurry mix tank; 18,000 gallon capacity	CDDC2	direct contact condenser; 2,000 to 3,000 pounds per hour ethylene glycol injection
DC8 MACT JJJ	Back up slurry mix tank	CDDC8	direct contact condenser; 2,000 to 3,000 pounds per hour ethylene glycol injection
BRIPAMT MACT JJJ	IPA/EG slurry mix tank; 10,000 gallon capacity	CDIPAMT	condenser
DC3 MACT JJJ	Slurry feed tank	CDDC3	condenser
DC4 MACT JJJ	Slurry feed tank	CDDC4	condenser
DC5 MACT JJJ ww1	Esterification reactor with glycol/water separation column/condenser/reflux drum	na	na

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
DC6 MACT JJJww1	Esterification reactor with glycol/water separation column/condenser/reflux drum	na	na
Continuous Processing/ Bottle Resin Polymerization - Amorphous Chip			
Y1UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDY1UFPPSC2	secondary spray condenser
Y1UFPPGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on Y1UFPP	na	na
Y1FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDY1FASC2	secondary spray condenser
Y1FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on Y1FA	na	na
Y2UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDY2UFPPSC2	secondary spray condenser
Y2UFPPGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on Y2UFPP	na	na
Y2FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDY2FASC2	secondary spray condenser
Y2FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on Y2FA	na	na
Y3UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDY3UFPPSC2	secondary spray condenser
Y3UFPPGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on Y3UFPP	na	na
Y3FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDY3FASC2	secondary spray condenser
Y3FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on Y3FA	na	na

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
Amorphous Chip Processing			
BRCDRY	chip dryer	CDDRY	fabric filter; maximum 6.1:1 air to cloth ratio
BRCBT1	chip buffer tank No. 1	CDCBT	fabric filter; maximum 6.1:1 air to cloth ratio
BRCBT2	chip buffer tank No. 2		
BRCBT3	chip buffer tank No. 3		
BRCS1	amorphous chip silo No. 1	CDCS1	fabric filter; maximum 6.1:1 air to cloth ratio
BRCS2	amorphous chip silo No. 2	CDCS2	fabric filter; maximum 6.1:1 air to cloth ratio
BRCS3	amorphous chip silo No. 3	CDCS3	fabric filter; maximum 6.1:1 air to cloth ratio
BRCS4	amorphous chip silo No. 4	CDCS4	fabric filter; maximum 6.1:1 air to cloth ratio
Solid State Polymerization			
BRSSPCRL	amorphous rail car chip loadout	CDSSPCRL	fabric filter; maximum 6:1 air to cloth ratio
BRSSPFB	precrystallizer feed bin	CDSSPFB	fabric filter; maximum 3.7:1 air to cloth ratio
BRPCR	post consumer recycle bin	CDPCR	fabric filter; maximum 8:1 air to cloth ratio
BRSSPCRY	precrystallizer	CDSSPCRYA	fabric filter; maximum 0.7:1 air to cloth ratio
		CDSSPCRYB	fabric filter; maximum 0.7:1 air to cloth ratio
BRSSPDRY	chip dryer with integral cyclone	na	na
BRSSPDC	dryer conveyor	CDSSPDC	fabric filter; maximum 0.5:1 air to cloth ratio
BRSSPPD	product deduster	CDSSPPD	fabric filter; maximum 7:1 air to cloth ratio
BRPS1	product silo No. 1	CDSSPPS1	fabric filter; maximum 6:1 air to cloth ratio
BRPS2	product silo No. 2	CDSSPPS2	fabric filter; maximum 6:1 air to cloth ratio
BRPS3	product silo No. 3	CDSSPPS3	fabric filter; maximum 6:1 air to cloth ratio

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
BRPS4	product silo No. 4	CDSSPPS4	fabric filter; maximum 6:1 air to cloth ratio
BRSSPPRL	rail car drop pots	CDSSPPRL	fabric filter; maximum 6:2 air to cloth ratio
BRSSPPRS	rail car silo	CDSSPPRS	fabric filter; maximum 6:1 air to cloth ratio
Continuous Processing - Staple Resin Polymerization			
AOS* ML14A	DMT storage tank	na	na
AOS* ML14B	DMT storage tank	na	na
AOS* ML14C	DMT storage tank	na	na
AOS* ESEVS1 MACT JJJ	DMT ester exchange reactor	CDEVS1	condenser
S1UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS1UFPPSC2	secondary spray condenser
S1UFPPEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on S1UFPP	na	na
S1FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS1FASC2	secondary spray condenser
S1FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on S1FA	na	na
AOS* ESEVS2 MACT JJJ	DMT ester exchange reactor	CDEVS2	condenser
S2UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS2UFPPSC2	secondary spray condenser
S2UFPPEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on S2UFPP	na	na
S2FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS2FASC2	secondary spray condenser

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
S2FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on S2FA	na	na
AOS* ESEVS3 MACT JJJ	DMT ester exchange reactor	CDEVS3	condenser
S3UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS3UFPPSC2	secondary spray condenser
S3UFPPPEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on S3UFPP	na	na
S3FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS3FASC2	secondary spray condenser
S3FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on S3FA	na	na
AOS* ESEVS4 MACT JJJ	DMT ester exchange reactor	CDEVS4	condenser
S4UFPP MACT JJJ	Upflow prepolymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS4UFPPSC2	secondary spray condenser
S4UFPPPEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka UFPP hotwell) for the spray condensers on S4UFPP	na	na
S4FA MACT JJJ	Finisher agitator polymerizer with primary and secondary spray condensers and steam jet vacuum system	CDS4FASC2	secondary spray condenser
S4FAEGRT MACT JJJ	Spray condenser ethylene glycol reclaim tank (aka finisher agitator hotwell) for the spray condensers on S4FA	na	na
ML11A	spinning operation	CDM11A	demister
ML11B	spinning operation	CDM11B	demister
ML11C	spinning operation	CDM11C	demister
ML11D	spinning operation	CDM11D	demister
ML11E	spinning operation	CDM11E	demister
ML11F	spinning operation	CDM11F	demister

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
ML11G	spinning operation	CDM11G	demister
ML11H	spinning operation	CDM11H	demister
ML33A	draw machine with heated staple relaxer	na	na
ML33B	draw machine with heated staple relaxer	na	na
ML33C	draw machine with heated staple relaxer	na	na
ML33D	draw machine with heated staple relaxer	na	na
ML33E	draw machine with heated staple relaxer	na	na
ML33F	draw machine with heated staple relaxer	na	na
ML33G	draw machine with heated staple relaxer	na	na
ML33H	draw machine with heated staple relaxer	na	na
<p>AOS* ML73L</p> <p>AOS* ML73C, S, and N MACT JJJ SV1</p> <p>AOS* ML73CVS MACT G/H</p>	<p>methanol truck loading rack (6,217 gallons per hour loadout rate) for DMT continuous process materials recovery</p> <p>three methanol storage tank (40,216 gallons each) for DMT continuous process materials recovery</p> <p>closed vent system to control device.</p>	<p>CDML73 MACT JJJ WW1</p>	<p>Control Device venturi scrubber; 500 pounds per hour minimum water injection</p>
Ethylene Glycol Refining Area			
<p>GLY1A NSPS VV/MACT H NSPS NNN MACT JJJ</p> <p>GLY1B NSPS VV/MACT H NSPS NNN MACT JJJ</p> <p>GLY1H MACT F,G ww1</p> <p>GLY1I</p>	<p>ethylene glycol separation unit with steam jet vacuum system TOC TRE=19.6</p> <p>ethylene glycol distillation unit with reflux condenser, reflux drum, and steam jet vacuum system TOC TRE=19.6</p> <p>feed tank for Direct Coupling Oligomer flash column (DCOFC)</p> <p>ethylene glycol (distillation column overheads) hold tank</p>	<p>CDGLY1 MACT F,G ww1</p>	<p>Control Device packed bed scrubber; 4,500 pounds per hour minimum water injection rate</p>

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
GLY2A GLY2B GLY2C GLY2D MACT JJJ GLY2E & GLY2F GLY2G & GLY2H	refined ethylene glycol truck loading ethylene glycol distillation column residue (bottoms) tank ethylene glycol distillation column residue truck loading spent ethylene glycol feed tank two refined ethylene glycol storage tanks two ethylene glycol analysis tank	CDGLY2 MACT F,G ww1	Control Device packed bed scrubber; 4,500 pounds per hour water minimum injection rate
GLY3A ML97 & ML142 ML77A & ML77B	ethylene glycol unloading twp refined ethylene glycol storage tanks for rail car load out two spent ethylene glycol tanks; 40,000 gallon capacity each	CDGLY3	Control Device packed bed scrubber; 4,500 pounds per hour minimum water injection rate
Storage Tanks			
S1	east acetic acid storage tank; 375,000 gallon capacity	CDS1	Control Device packed bed scrubber; one gallon per minute minimum injection rate
S2	west acetic acid storage tank; 375,000 gallon capacity	CDS2	Control Device packed bed scrubber; one gallon per minute minimum injection rate
S5 MACT F,G sv2	p-xylene day tank; 250,000 gallon capacity	na	na
Wastewater			
CDPR9 MACT F,G ww1	methanol storage and loading scrubber bleed stream	to be determined	to be determined
CDML73 MACT JJJ ww1	DMT methanol storage and loading scrubber bleed stream	to be determined	to be determined
CDGLY1 MACT JJJ ww1	ethylene glycol refining area scrubber bleed stream	to be determined	to be determined
CDGLY2 MACT JJJ ww1	ethylene glycol refining area scrubber bleed stream	to be determined	to be determined
CDA44 MACT F,Gww1	fume abator halogen control scrubber bleed stream	to be determined	to be determined

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
GLYH1 MACT JJJ	flash column feed tank	CDGLY1 MACT JJJ ww1	packed bed scrubber; 4,500 pounds per hour minimum water injection
Y1HW NSPS DDD MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two Y1 steam jet vacuum systems	na	na
Y2HW NSPS DDD MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two Y2 steam jet vacuum systems	na	na
Y3HW NSPS DDD MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two Y3 steam jet vacuum systems	na	na
S1HW MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two S1 steam jet vacuum systems	na	na
S2HW MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two S2 steam jet vacuum systems	na	na
S3HW MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two S3 steam jet vacuum systems	na	na
S4HW MACT JJJ ww2	barometric tank (a.k.a. VOC hotwell) for condensate from the two S4 steam jet vacuum systems	na	na
W1 through W14 MACT F,G ww2	wastewater retention/equalization/aeration basins, polishing ponds, and clarifiers	na	na
Utilities			
P21	TPA Line No. 2 natural gas, propane-fired incinerator; 4,800 pounds per hour charge and 40 million Btu per hour heat input capacity	CDP21	fabric filter; 19,782 square feet of filter area
ES01	coal/No. 6 fuel oil/DS11 filter cake/waste finishing and lubricating oil/dimethyl ether process waste-fired boiler; 240 million Btu per hour heat input capacity	CD01	fabric filter; 43,890 square feet of filter area
ES02	coal/No. 6 fuel oil/DS11 filter cake/waste finishing and lubricating oil/dimethyl ether process waste-fired boiler; 240 million Btu per hour heat input capacity	CD02	fabric filter; 43,890 square feet of filter area

Emission Source ID No.	Emission Source Description	Control (Recovery) Device ID No.	Control (Recovery) Device Description
ES05	No. 6 fuel oil/natural gas/waste oil-fired Dowtherm™ heater; 80 million Btu per hour heat input capacity	na	na
ES06	No. 6 fuel oil/natural gas/waste oil-fired Dowtherm™ heater; 80 million Btu per hour heat input capacity	na	na
ES07	No. 6 fuel oil/natural gas/waste oil/process waste-fired monomer boiler; 168 million Btu per hour heat input capacity	na	na
ES09	No. 6 fuel oil/natural gas/waste oil/process waste-fired monomer boiler; 168 million Btu per hour heat input capacity	na	na
ES10	No. 6 fuel oil/natural gas/waste oil/process waste-fired monomer boiler; 168 million Btu per hour heat input capacity	na	na
ES11	No. 6 fuel oil/natural gas/waste oil-fired Dowtherm™ vaporizer; 27 million Btu per hour heat input capacity	na	na
ES12	No. 6 fuel oil/natural gas/waste oil-fired Dowtherm™ vaporizer; 27 million Btu per hour heat input capacity	na	na
ES13	No. 6 fuel oil/natural gas/waste oil-fired Dowtherm™ vaporizer; 32 million Btu per hour heat input capacity	na	na
ES14	No. 6 fuel oil/natural gas/waste oil-fired Dowtherm™ vaporizer; 32 million Btu per hour heat input capacity	na	na
ML104	bottler resin cooling tower	na	na
ML105	staple resin cooling tower	na	na

* alternate operating scenario where dimethylterephthalate (DMT) is used to produce PET monomer instead of terephthalic acid (TPA) which is regulated as the continuous dimethyl terephthalate process.

VI. Emission Source-by-Source Evaluation

A. HON Group 1 Process Vents:

Process Vent (ID No. A41CVS) venting to fume abator (ID No. CDA43) with halogen control wet scrubber (ID No. CDA44) including:

- 1 methyl acetate storage tank (ID No. A41MAST),
- 1 methyl acetate hydrolyzation reactor (ID No. A41MAHR),
- 1 acetic acid separator column (ID No. A41AASC), and
- 1 methyl acetate column (ID No. A41MAC).

¹Process Vent (ID No. A42CVS) venting to fume abator (ID No. CDA43) with halogen control wet scrubber (ID No. CDA44) including scrubber bottoms stripper column/reflux condenser (ID No. A42BSCS).

HON Group 2 Process Vents:

^{2,4} Absorber (ID No. RDA11) for:

- ^{1,2} air oxidation reactor (ID No. A11OX1),
- ^{1,2} air oxidation reactor (ID No. A11OX2), and
- ^{1,2} air oxidation reactor (ID No. A11OX3).

^{2,4} Absorber (ID No. RDA21) for:

- ^{1,2} air oxidation reactor (ID No. A21OX1),
- ^{1,2} air oxidation reactor (ID No. A21OX2), and
- ^{1,2} air oxidation reactor (ID No. A21OX3).

⁴Absorber (ID No. RDA13) for:

- ¹ air oxidation reactor feed mix drum (ID No. A13FMD),
- ¹ first stage separations mother liquor drum, centrifuges, reslurry drum (ID No. A13FSMLD), hydroclone system filtrate receiver, five hydroclones (ID No. A13HCSFR), hydroclone slurry tank (ID No. A13HCST), second stage separations knockout pot for Rovac filter system (ID No. A13SSKP), second stage separations Rovac filter system (ID No. A13ROVAC), second stage separations Rovac filtrate tank/condenser (ID No. A13RFT), second stage separations three centrifuges (ID No. A13TCF), second stage separations centrate receiver (ID No. A13CRTCF), TPA dryer (ID No. A13DRY) with primary scrubber, three catalyst recovery tank (ID Nos. A13CRT1, A13CRT2, A13CRT3), two catalyst recovery centrifuge (ID No. A13CRC1, A13CRC2), acetic acid recovery solvent charge drum (ID No. A13SCD), acetic acid recovery dehydration tower bottoms receiver (ID No. A13DSD),
- ¹ acetic acid stripper still pot, stripper bottoms hold tank, solvent stripper-dehydration tower/reflux condensate drum (ID No. A13AASR), and
- TPA rework/rewash tank (ID No. A13T).

⁴Absorber (ID No. RDA23) for:

- ¹ air oxidation reactor feed mix drum (ID No. A23FMD),
- ¹ first stage separations mother liquor drum, centrifuges, reslurry drum (ID No. A23FSMLD), hydroclone system filtrate receiver, slurry tank. hydroclone (ID No. A23HCSFR), second stage separations knockout pot for Rovac filter system (ID No. A23SSKP), second stage separations filtrate tank , Rovac filter system (ID No. A23SSFT), second stage separations Rovac filtrate tank/condenser (ID No. A13RFT), second stage separations three centrifuges, centrate receiver (ID No. A23SSFUGES), TPA dryer (ID No. A23DRY) with primary scrubber, solvent separations solvent charge drum (ID No. A23SCD),
- ¹ solvent separations stripper still pot, solvent stripper/condenser (ID No. A23AARS), solvent separations stripper bottoms hold tank (ID No. A23AARSB),

- 1 solvent separations stripper bottoms residue concentrator/condenser (ID No. A23RC),
- 1 solvent separations dehydration tower, condenser, condensate drum (ID No. A23AARDT),
- solvent separations dehydration tower bottoms tank (ID No. A23DSD)
- 1 BA/MA recovery butyl acetate decanter (ID No. A23BAD),
- 1 BA/MA recovery butyl acetate recovery column with reflux condenser (ID No. A23BAR), and
- 1 BA/MA recovery methyl acetate purge column with reflux condenser (ID No. A23MAP).

⁴Absorber (ID No. RDA24) for:

- 1 first stage separations centrifuges, reslurry drum, centrate level drum (ID No. A24FSFUGE),
- second stage separations knockout pot for Rovac filter system (ID No. A24SSKP),
- second stage separations filtrate tank, Rovac filter system (ID No. A24SSFT),
- second stage separations three centrifuges, centrate receiver (ID No. A24SSFUGES),

⁴Absorber (ID No. RDC11) for:

- 1 crystallizer (ID No. C11CRY1),
- 1 crystallizer (ID No. C11CRY2),
- 1 crystallizer (ID No. C11CRY3), and
- 1 crystallizer (ID No. C11CRY4).

⁴Absorber (ID No. RDC21) for:

- 1 crystallizer (ID No. C21CRY5),
- 1 crystallizer (ID No. C21CRY6),
- 1 crystallizer (ID No. C21CRY7), and
- 1 crystallizer (ID No. C21CRY8).

^{1,3} Methanol distillation column (ID No. MC1)

1. Description

- a. Vents A41 and A42 are controlled with water scrubbers which vent to a combustion device (with heat recovery) and a wet scrubber to control halogen emissions. The scrubber bleed streams are fed to the bottoms stripper column (ID No. A42BSCS) which vents to RDA42. The bottoms stripper column also receives acetic acid from the scrubbers on A11, A21, and A13. Apparently this stripper column separates methyl acetate (MA) and methanol (MeOH) from acetic acid (AA) and water (H₂O). The MA/MeOH overhead stream is sent to the methyl acetate column whose MeOH/H₂O bottoms stream goes to the methanol column (ID No. MC1) and the overheads go to the MA storage tank (ID No. A41MAST).
The methanol column discharges the H₂O bottoms stream as a Group 2 wastewater and the overheads stream (MeOH) is sent to storage. The MA storage tank feeds the hydrolizer (ID No. A41MAHR) which converts MA to AA, MeOH, and H₂O which is sent to the AA separator column (ID No. A41AASC). The AA separator column bottoms stream (AA and H₂O) is sent to the AA solvent charge drum for further separation in AA recovery and the overhead stream (MA and MeOH) is sent to the MA column.
- b. Vents A11 and A21 are controlled with absorbers (under high pressure) that absorb air oxidation reactor off gas constituents in an acetic acid contact stage and subsequently in a water contacting stage. The absorber acetic acid bleed stream is sent to the bottoms stripper column (ID No. A42BSCS) and the absorber water bleed stream is sent to acetic acid recovery. Air oxidation reactors use acetic acid, xylene, and air to create terephthalic acid. Off gases from the esterification process water organic stripper (aka "Flash" (?) column; ID No. DCOFC) are sent to the fix mix drum for the air oxidation reactors and HAPs such as acetaldehyde from the esterification process are converted to acetic acid in the same reactor. (Note that the air oxidation reactor feed tank is vented to RDA13 and that the applicant has stated that the tank only vents under pressure, indicating that all DCOFC off gas is processed as a recovery stream. However, the applicant was not able to provide any data to substantiate a vapor balance in this tank. None the less, RD13 would most likely provide an additional stage for recovery although it is not known if acetaldehyde recovered in the acetic acid contacting stage would be subsequently

- converted for some production purpose or eventually emitted from RDA42 vent, as its bleed stream is recycled to the stripper column from which it receive off gas , in insignificant concentrations thereby negating the intent of HAP recovery/abatement.)
- c. Vent A13 is controlled with a two stage absorber similar to RDA11 and RDA21 except under atmospheric pressure. The bleed streams from this absorber are also sent to recovery. The absorber handles emissions from process steps after air oxidation reaction including post TPA crystallization slurry separations, TPA refining, TPA drying, TPA handling, air oxidation reactor catalyst recovery operations, and acetic acid recovery operations (i.e., AA and H₂O separations using butyl acetate as an azeotrope breaker).
 - d. Vent A23 is controlled with a water absorber (ID No. RDA23). The bleed stream from this absorber are also sent to recovery. The absorber handles emissions from process steps after air oxidation reaction including post TPA crystallization slurry separations, TPA refining, TPA drying, acetic acid recovery operations (i.e., AA and H₂O separations using butyl acetate as an azeotrope breaker), and butyl acetate/MA separations equipment.
 - e. Vent A24 is controlled with a water absorber (ID No. RDA24). The bleed stream from this absorber are also sent to recovery. The absorber handles emissions from process steps after air oxidation reaction including post TPA crystallization slurry separations, TPA refining, and TPA drying in redundancy to Line No. 2 TPA production equipment.
 - f. Vents RDC11 and RDC21 are controlled with water contacting absorbers whose bleed steams are sent to AA recovery. The absorbers recovery constituents (e.g., AA) from the crystallizers. The crystallizers received the air oxidation reactor reacted materials and cools the stream to initiate crystallization of TPA which is later separated from the remaining liquid and purified. The liquid stream is sent to the AA recovery stripper still pot.
 - g. The methanol column separates water from methanol generated in the production of acetic acid from methyl acetate.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs	<u>Group 1 Process Vents</u> HAP emissions will be reduced by 98 percent by weight or to 20 ppmv, whichever is less stringent. Group 1 process vents that are combusted shall be vented to a scrubber to reduce halide/hydrogen halide emissions by 99 percent or to less than 0.45 kilograms per hour, whichever is less stringent.	15A NCAC 2D .1111 (40 CFR 63, Subpart G) Group 1 process vents 40 CFR 63.113(a)(2) 40 CFR 63.113(c)
HAPs	<u>Group 2 Process Vents</u> The Total Resource Effectiveness (TRE) index value of the process vent shall be maintained at a value greater than 4.0	15A NCAC 2D .1111 (40 CFR 63, Subpart F and G) Group 2 process vents 40 CFR 63.113(e)
VOC ²	Recordkeeping Requirements	15A NCAC 2D .0524 40 CFR 60, Subpart III [Pursuant to 40 CFR 63.110(d)(2)]
VOC ³	Recordkeeping Requirements	15A NCAC 2D .0524 40 CFR 60, Subpart NNN [Pursuant to 40 CFR 63.110(d)(5)]

carbon monoxide ⁴	PSD Avoidance Condition emissions shall not exceed 11,315 tons per year from the production of terephthalic acid	15A NCAC 2Q .0317
HAPs	See “Multiple Emission Sources” Section VII A.1. General Recordkeeping and Reporting - HON Subpart G	15A NCAC 2D .1111 (40 CFR 63.152)
HAPs	See “Multiple Emission Sources” Section VII B.1. General Applicability , Standards , Recordkeeping and Reporting Provisions - HON Subpart F	15A NCAC 2D .1111 (40 CFR 63.102 and 63.103)
HAPs	See “Multiple Emission Sources” Section VII B.2. Heat Exchanger Requirements - HON Subpart F	15A NCAC 2D .1111 (40 CFR 63.104)
HAPs	See “Multiple Emission Sources” Section VII B.3. Maintenance Wastewater Requirements - HON Subpart F	15A NCAC 2D .1111 (40 CFR 63.105)
HAPs	See “Multiple Emission Sources” Section VII C. Equipment Leak Provisions - HON Subpart H	15A NCAC 2D .1111 (40 CFR 63, Subpart H)
HAPs	See “Multiple Emission Sources” Section VII D. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) NESHAP Operation and Maintenance Requirements
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII F.1. Work Practice Standards	15A NCAC 2D .0958
Odors	See “Multiple Emission Sources” Section VII F.2. Control and Prohibition of Odorous Emissions “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1806
Toxic Air Pollutants	See “Multiple Emission Sources” Section VII F.3 Allowable Ambient levels “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1100

1 denotes HON affected equipment.

2 denotes that these sources are NSPS Subpart III affected equipment.

3 denotes that these sources are NSPS Subpart NNN affected equipment.

4 denotes that these sources are included in PSD avoidance limit.

a. Group 1 Process Vents

i. Control Requirements

The Permittee is required to control emissions of total organic hazardous air pollutants from the Group 1 process vents to be reduced by 98 weight percent or to a concentration of 20 parts per million by volume, whichever is less stringent; and halogenated vent streams from Group 1 process vents that are combusted shall be controlled with a combustion device shall be conveyed to a halogen reduction device, scrubber, before it is discharged to the atmosphere. The halogen reduction device shall reduce overall emissions of hydrogen halides and halogens, as by 99 percent or shall reduce the outlet mass of total hydrogen halides and halogens to less than 0.45 kilogram per hour, whichever is less stringent. However, a halogen reduction device, scrubber, may be used to reduce the vent stream halogen atom mass emission rate to less than 0.45 kilogram per hour prior to any combustion control device, and thus make the vent stream non halogenated.

- ii. **Testing Requirements**

The Permittee is required to perform tests to demonstrate compliance with the above requirements within a reasonable time period if previously accepted testing has not been previously performed or if parameters for monitoring combustion zone temperature, scrubber pH, and scrubber liquid/gas flow rates during performance testing were not established during the testing.
 - iii. **Monitoring Requirements**

The Permittee is required to shall install a temperature monitoring device with a continuous recorder in the firebox of the combustion control device, a pH monitoring device equipped with a continuous recorder shall be installed to monitor the pH of the scrubber effluent, and a flow meter equipped with a continuous recorder located at the scrubber in fluent for liquid flow. Gas flow rate shall be determined and the Permittee is required to monitor any control device bypass.
 - iv. **Recordkeeping Requirements**

The Permittee is required to maintain records of all the monitored parameters, the performance testing and determination of the monitoring parameters, and control device bypasses.
 - v. **Reporting Requirements**

The Permittee is required to submit a request to revise the Title V application to incorporate monitoring parameters, and report semi annually any periods when the parameters where exceeded, when monitoring data was not sufficient to demonstrate compliance, and ant control device bypasses.
- b. **Group 2 Process Vents**
- i. **Requirements**

The Permittee is required to maintain a TRE index value greater than 4.0 for all process vents with a Group 2 designation.
 - ii. **Recordkeeping Requirements**

The Permittee shall maintain records, measurements, engineering assessments, and calculations performed to determine the TRE index value of the vent stream and any process changes.
 - iii. **Reporting Requirements**

The Permittee is require to submit an application for Title V modification should nay process vent Group designations change as a result of a process modification.
- c. **New Source Performance Standards for VOC Emissions from the Synthetic Organic Chemical Manufacturing Industry Air Oxidation Unit Process (III)**

A Group 2 process vent is required to comply HON (40 CFR 63, Subpart G) and NSPS (40 CFR 60, Subpart III) for applicability determination, recordkeeping, reporting; and recalculation of the TRE index value. If the Group 2 process vent has a TOC TRE less than 1 (as determined by 40 CFR 60, Subpart III for total organic compounds), the Permittee must comply with the control requirements in 40 CFR 60.612 of Subpart III. However, the Permittee may elect to comply with either NSPS or HON testing, monitoring, recordkeeping, and reporting requirements for Group 1 process vents.

d. **New Source Performance Standards for VOC Emissions from the Synthetic Organic Chemical Manufacturing Industry Distillation Operations (NNN)**

A Group 2 process vent is required to comply with HON (40 CFR 63, Subpart G) and NSPS (40 CFR 60, Subpart NNN) for applicability determination, recordkeeping, reporting; and for recalculation of the TRE index value.

e. **PSD Avoidance Condition**

Total carbon monoxide emissions from the TPA Lines 1 and 2 must be less than 11,315 tons per year and the total 12 consecutive month usage of p-xylene for terephthalic acid production shall not exceed 473,000 tons (a nominal production rate of 730,000 tons per year of terephthalic acid), as it related to CO emissions, without using control devices to reduce emissions. As yet the

catalytic recuperative oxidizer (ID No. A-45) has not been used to comply with this limitation; however, efficiency testing will be required if it is ever used.

i. Monitoring/Recordkeeping Requirements

The Permittee shall record the monthly xylene use for each month and calculate a rolling annual total for a 12 consecutive month period.

ii. Reporting Requirements

Quarterly reporting of 12 consecutive month totals is required. A Compliance Assurance Monitoring plan is required should the catalytic recuperative oxidizer (ID No. A-45) ever be used for compliance with this limitation.

B. Tanks/Transfer Operations

² Vent system (ID No. PR9CVS) with Packed Tower Scrubber (ID No. CDPR9) on:

- ² recovered methanol storage tank (ID No. PR9RMST),
- ² distilled methanol storage tank (ID No. PR9DMST),
- PR9 scrubber recirculation tank (ID No. PR9DMSR), and
- ^{3,5} methanol loading rack (ID No. PR9MLR).

¹ Vent system (ID No. ML73CVS) with venturi scrubber (ID No. CDML73) on:

- ¹ three methanol storage tanks (ID Nos. ML73C, ML73S, and ML73N) and
- ³ methanol loading rack (ID No. ML73L).

packed bed scrubber (ID No. CDS1) on east acetic acid storage tank.

packed bed scrubber (ID No. CDS2) on west acetic acid storage tank.

⁴ p-xylene day tank.

1. Description

The PR9 sources are HON affected sources for receiving and loadout of methanol generated in the methyl acetate conversion process. The ML73 sources are JJJ affected sources for receiving and loadout of methanol from TPA production using DMT. Acetic acid and xylene are raw materials used in TPA production.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
VOC ²	floating roof tank or vapor capture and control required	15A NCAC 2D .0949
VOC ³	VOC emissions from transfer operations	15A NCAC 2D .0948
HAPs ^{1,2}	<u>Group 1 Fixed Roof Storage Vessels with Closed Vent Systems and Control</u> HAP emissions will be reduced by greater than 90 percent with a wet scrubber	15A NCAC 2D .1111 (40 CFR 63, Subpart G) Group 1 storage vessels 40 CFR 63.119(e)
HAPs ⁴	<u>Group 2 Storage Vessels</u> Recordkeeping only	15A NCAC 2D .1111 (40 CFR 63, Subpart G) Group 2 storage vessels 40 CFR 63.119(a)(3)

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs ⁵	<u>Group 1 Transfer Operations</u> Recordkeeping	15A NCAC 2D .1111 (40 CFR 63, Subpart G) Group 1 Transfer Operations 40 CFR 63.126(c)
HAPs	See “Multiple Emission Sources” Section VII A.1. General Recordkeeping and Reporting - HON Subpart G	15A NCAC 2D .1111 (40 CFR 63.152)
HAPs	See “Multiple Emission Sources” Section VII A.2. HON Subpart G Leak Inspection Provisions	15A NCAC 2D .1111 (40 CFR 63.148)
HAPs	See “Multiple Emission Sources” Section VII B.1. General Applicability , Standards , Recordkeeping and Reporting Provisions - HON Subpart F	15A NCAC 2D .1111 (40 CFR 63.102 and 63.103)
HAPs	See “Multiple Emission Sources” Section VII C. Equipment Leak Provisions - HON Subpart H	15A NCAC 2D .1111 (40 CFR 63, Subpart H)
HAPs	See “Multiple Emission Sources” Section VII D. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) NESHAP Operation and Maintenance Requirements
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII F.1. Work Practice Standards	15A NCAC 2D .0958
Odors	See “Multiple Emission Sources” Section VII F.2. Control and Prohibition of Odorous Emissions “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1806
Toxic Air Pollutants	See “Multiple Emission Sources” Section VII F.3. Allowable Ambient levels “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1100

^{1,2, 3,4,5} denotes that requirement is applicable to these sources only

²a. 15A NCAC 2D .0949: STORAGE OF MISCELLANEOUS VOLATILE ORGANIC COMPOUNDS

i. Control Requirements

The Permittee is required to used floating roofs or vapor capture and control systems for tanks that has a capacity greater than 50,000 gallons (189.3 m³) storing any liquid volatile organic compound that has a vapor pressure of 1.5 pounds per square inch absolute (10.34 kPa) or greater under actual storage conditions. The affected tanks vent to a closed vent system controlled by a scrubber. Affected are tanks ID Nos. PR9MST and PR9DMST.

ii. Monitoring/Recordkeeping/Reporting

Monitoring, recordkeeping, and reporting requirements are the same as those covered under HON.

^{1,2}b. HON Group 1 Fixed Roof Storage Vessels with Closed Vent Systems and Control

i. Control Requirements

The Permittee is required to reduce emissions of total organic hazardous air pollutants from the Group 1 storage vessels by 90 weight percent or greater with the use of scrubber (ID No. CDPR9) or as may be required under the more stringent requirements for Group 1 transfer operations for the scrubber ID No. CDML73. However, periods of planned routine

maintenance of the control device, during which the control device does not meet the control requirement may be up to 240 hours per year and the control requirements do not apply during periods of planned routine maintenance or during a control system malfunction.

ii. Compliance/Testing Requirements

The Permittee is required to test or to otherwise prove that the control is being achieved. The Permittee has stated that the scrubber is over designed for the sources it controls and that no scrubber water is discarded. The methanol is effectively re introduced to the atmosphere under this scenario unless it is disposed of a wastewater to wastewater treatment. The Permittee will be required to specify a bleed stream rate to ensure control.

iii. Recordkeeping Requirements

The Permittee is required to keep readily accessible records showing the dimensions of the storage vessel, analysis showing the capacity of the storage vessel, records the measured values of the parameters monitored for the scrubber in accordance with the monitoring plan/operating permit; and records of the planned routine maintenance performed on the control device including the duration of each time the control device does not meet the minimum control requirement due to the planned routine maintenance.

iv. Reporting Requirements

The Permittee shall submit information for planned routine maintenance operations that would require the control device not to meet the minimum control requirements, a description of the planned routine maintenance that was performed for the control device during the previous six months, description of each occurrence when the monitored parameters were outside of the parameter ranges, and identification of the control device for which the measured parameters were outside of the established ranges, and cause for the measured parameters to be outside of the established ranges.

⁴c. HON Group 2 Storage Vessels

i. Recordkeeping Requirement

The Permittee is required to keep readily accessible records showing the dimensions of the storage vessel and an analysis showing the capacity of the storage vessel.

³d. 15A NCAC 2D .0948: VOC EMISSIONS FROM TRANSFER OPERATIONS

The Permittee shall not load in any one day more than 20,000 gallons of volatile organic compounds with a vapor pressure of 1.5 pounds per square inch (10.34 kPa; 77.86 mm Hg) or greater under actual conditions into any tank-truck, trailer, or railroad tank car from any loading operation unless the loading operation uses submerged loading through boom loaders that extend down into the compartment being loaded or by other methods that are at least as efficient based on source testing or engineering calculations.

⁵e. HON Group 1 Transfer Operations

i. Control Requirements

- (a) The Permittee is required to control l the group 1 transfer rack (ID No. ML73L) with a vapor collection system and control device (ID No. CDML73). The scrubber shall reduce emissions of total organic hazardous air pollutants by 98 weight-percent or to an exit concentration of 20 parts per million by volume, whichever is less stringent.
- (B) The Permittee is required to load organic HAPs into only tank trucks and railcars which are certified as leak free and compatible with any vapor return system

ii. Monitoring Requirements

The Permittee is required to use an organic monitoring device equipped with a continuous recorder, or a scrubbing liquid temperature monitoring device equipped with a continuous recorder and a specific gravity monitoring device equipped with a continuous recorder. Any bypass must also be monitored.

iii. Testing Requirements

a performance test is required for determining compliance with the reduction of total organic HAP emissions for the scrubber control device and determine monitoring

parameters during testing. The Permittee is also required to check the vapor collection system and vapor balancing systems while a tank truck or railcar is being loaded demonstrate vapor tightness of tank trucks and railcars. However; the Permittee prepare, a design evaluation that shall document that the control device being used achieves the required control efficiency if a transfer rack transfers less than 11.8 million liters (3.12 million gallons) per year.

iv. Recordkeeping and Reporting Requirements

The Permittee is required to maintain a record describing in detail the vent system used to vent each affected transfer vent stream to a control device, continuous records of the scrubbing liquid temperature and specific gravity or organic compounds emissions, records of the daily average value of each monitored parameter for each operating day, and any bypass of the control device. Semi annual reporting of deviations from the control, monitoring or recordkeeping stipulations is required.

C. Polymers and Resins IV Continuous Process Vents

Esterification/Materials Preparation TPA/EG

- 1 slurry mix tank (ID No. DC1) with direct contact condenser (ID No. CDDC1)
- 1 slurry mix tank (ID No. DC2) with direct contact condenser (ID No. CDDC2)
- 1 backup slurry mix tank (ID No. DC8) with direct contact condenser (ID No. CDDC8)
- 1 IPA/EG slurry mix tank (ID No. BRIPAMT) with condenser (ID No. CDIPAMT)
- 1 slurry feed tank (ID No. DC3) with condenser (ID No. CDDC3)
- 1 slurry feed tank (ID No. DC4) with condenser (ID No. CDDC4)
- 1 esterification reactor (ID No. DC5)
- 1 esterification reactor (ID No. DC6)

Esterification/Materials Preparation DMT/EG (AOS)

- 2 DMT ester exchange reactor (ID No. ESEVS1) with condenser (ID No. CDEVS1)
- 2 DMT ester exchange reactor (ID No. ESEVS2) with condenser (ID No. CDEVS2)
- 2 DMT ester exchange reactor (ID No. ESEVS3) with condenser (ID No. CDEVS3)
- 2 DMT ester exchange reactor (ID No. ESEVS4) with condenser (ID No. CDEVS4)

Polymerization - BOTTLE Resin

- 3 upflow prepolymerizer (ID No. Y1UFPP) with secondary spray condenser (ID No. CDY1UFPPSC2)
- 3 spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. Y1UFPPEGRT)
- 3 finisher agitator (ID No. Y1FA) with secondary spray condenser (ID No. CDY1FASC2)
- 3 spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. Y1FAEGRT)
- 3 upflow prepolymerizer (ID No. Y2UFPP) with secondary spray condenser (ID No. CDY2UFPPSC2)
- 3 spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. Y2UFPPEGRT)
- 3 finisher agitator (ID No. Y2FA) with secondary spray condenser (ID No. CDY2FASC2)
- 3 spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. Y2FAEGRT)
- 3 upflow prepolymerizer (ID No. Y3UFPP) with secondary spray condenser (ID No. CDY3UFPPSC2)
- 3 spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. Y3UFPPEGRT)
- 3 finisher agitator (ID No. Y3FA) with secondary spray condenser (ID No. CDY3FASC2)
- 3 spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. Y3FAEGRT)

Polymerization - STAPLE Resin

- 3 upflow prepolymerizer (ID No. S1UFPP) with secondary spray condenser (ID No. CDS1UFPPSC2)
- 3 spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. S1UFPPEGRT)
- 3 finisher agitator (ID No. S1FA) with secondary spray condenser (ID No. CDS1FASC2)
- 3 spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. S1FAEGRT)
- 3 upflow prepolymerizer (ID No. S1UFPP) with secondary spray condenser (ID No. CDS1UFPPSC2)
- 3 spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. S1UFPPEGRT)
- 3 finisher agitator (ID No. S1FA) with secondary spray condenser (ID No. CDS1FASC2)
- 3 spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. S1FAEGRT)

- ³ upflow prepolymerizer (ID No. S2UFPP) with secondary spray condenser (ID No. CDS2UFPPSC2)
- ³ spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. S2UFPPEGRT)
- ³ finisher agitator (ID No. S2FA) with secondary spray condenser (ID No. CDS2FASC2)
- ³ spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. S2FAEGRT)
- ³ upflow prepolymerizer (ID No. S3UFPP) with secondary spray condenser (ID No. CDS3UFPPSC2)
- ³ spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. S3UFPPEGRT)
- ³ finisher agitator (ID No. S3FA) with secondary spray condenser (ID No. CDS3FASC2)
- ³ spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. S3FAEGRT)
- ³ upflow prepolymerizer (ID No. S4UFPP) with secondary spray condenser (ID No. CDS4UFPPSC2)
- ³ spray condenser ethylene glycol reclaim tank (UFPP hotwell; ID No. S4UFPPEGRT)
- ³ finisher agitator (ID No. S4FA) with secondary spray condenser (ID No. CDS4FASC2)
- ³ spray condenser ethylene glycol reclaim tank (FA hotwell; ID No. S4FAEGRT)

Polymerization - Ethylene Glycol Recovery and Refining

packed bed scrubber (ID No. CDGLY1) on:

- ^{3,4,5} ethylene glycol separation unit (ID No. GLY1A),
- ^{3,4,5} ethylene glycol distillation unit (ID No. GLY1B),
- DCO flash column feed tank (ID No. GLY1H), and
- ethylene glycol hold tank (ID No. GLY1IA).

packed bed scrubber (ID No. CDGLY2) on:

- refined ethylene glycol truck loading (ID No. GLY2A),
- ethylene glycol residue tank (ID No. GLY2B),
- residue truck loading (ID No. GLY2C),
- ³ spent ethylene glycol feed tank (ID No. GLY2D),
- two refined ethylene glycol storage tanks (ID Nos. GLY2E and GLY2F), and
- two ethylene glycol analysis tanks (ID Nos. GLY2G and GLY2H).

packed bed scrubber (ID No. CDGLY3) on:

- ethylene glycol unloading (ID No. GLY3A),
- refined ethylene glycol storage tank (ID No. ML97),
- two refined ethylene glycol storage tanks (ID Nos. ML97 and ML142), and
- two spent ethylene glycol storage tanks (ID Nos. ML77A and ML77B).

1. Description

a. Esterification/Materials Preparation TPA/EG

Ethylene glycol and terephthalic acid are mixed to form a paste which is fed to the esterification reactors under temperature and pressure. The esterification reactors create monomer and oligomer for polymerization in a later step. Water and HAP byproducts (acetaldehyde and 1,4 dioxane) are also created during the esterification reaction and are vented along with ethylene glycol vapors to a reflux column which acts similar to a distillation column. The ethylene glycol is condensed and returned to the reactor from the column bottoms receiver and water/HAP byproducts leaving the column reflux condenser are further condensed in a secondary condenser and sent to the process water holding tanks, organic air stripping column feed tank, and then the organic air stripping column (ID No. DCOFC). The process water from the esterification reactors is not covered under any MACT requirement as organic compounds are reclaimed from this stream by the organic air stripping column. The organic stripping column was determined to be a recovery device because the overheads are returned to the process.

b. Esterification/Materials Preparation DMT/EG

Ethylene glycol and dimethyl terephthalate are mixed to form a paste which is fed to the esterification reactors under temperature and pressure. The esterification reactors create monomer and oligomer for polymerization in a later step. Water and HAP byproducts (acetaldehyde, methanol, and 1,4 dioxane) are also created during the esterification reaction and are vented along with ethylene glycol vapors to a reflux column which acts similar to a distillation column. The ethylene glycol is condensed and returned to the reactor from the column bottoms receiver and water/HAP byproducts leaving the column reflux condenser are sent to methanol storage for shipping off site.

c. Polymerization

The monomer/oligomer from esterification is polymerized in a two step process under temperature and vacuum. The upflow prepolymerizer initiates the reaction during which cross linking is increased and ethylene glycol liberated. The finisher concludes the polymerization reaction for this process. The vent stream from each polymerization reactor passes through a primary and secondary direct contact condenser which used cold ethylene glycol at the contacting medium. Non condensible emissions pass through the steam jet vacuum system and are vented to the steam jet hotwells along with steam jet condensate from direct contact condensers on the vacuum system. This hotwell water is circulated through the cooling tower and return to the steam jet vacuum system direct contact condensers.

2. Applicable Regulatory Requirements

The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants ¹	organic HAP emissions from all of the sources listed in the esterification/ materials preparation sections for PET esterification using terephthalic acid and ethylene glycol shall be no greater than 0.04 Kg per MG of PET polymer produced	15A NCAC 2D .1111 NESHAP Subpart JJJ: Group IV Polymers and Resins
Hazardous Air Pollutants ² AOS	outlet gas stream temperature of the final condenser on each DMT ester exchange reactor must not exceed 37 degrees F	15A NCAC 2D .1111 NESHAP Subpart JJJ: Group IV Polymers and Resins
Hazardous Air Pollutants ³	organic HAP emissions from all of the sources listed above in the polymerization sections shall be no greater than 0.02 Kg per Mg of PET polymer produced	15A NCAC 2D .1111 NESHAP subpart JJJ: Group IV Polymers and Resins
Volatile Organic Compounds ⁴	Exemption - New Source Performance Standards for Equipment leaks of VOC in the SOCOMI	15A NCAC 2D .0524 40 CFR 60, Subpart VV
Volatile Organic Compounds ⁵	Exemption - New Source Performance Standards for Emissions from SOCOMI Distillation Operations	15A NCAC 2D .0524 40 CFR 60, Subpart NNN
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII E.1. General Recordkeeping and Reporting - Subpart JJJ	15A NCAC 2D .1111 NESHAP Subpart JJJ: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII E.2. Maintenance Wastewater Requirements - Subpart JJJ	15A NCAC 2D .1111 NESHAP subpart JJJ: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII E.3. Heat exchanger Requirements - Subpart JJJ	15A NCAC 2D .1111 NESHAP Subpart JJJ: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII E.4. Equipment Leak Provisions - Subpart JJJ	15A NCAC 2D .1111 NESHAP Subpart JJJ: Group IV Polymers and Resins
Hazardous Air Pollutants	See “Multiple Emission Sources” Section VII D. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) NESHAP: Operation and Maintenance Requirements

Regulated Pollutant	Limits/Standards	Applicable Regulation
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII F.1. Work Practice Standards	15A NCAC 2D .0958
Odors	See “Multiple Emission Sources” Section VII F.2. Control and Prohibition of Odorous Emissions “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1806
Toxic Air Pollutants	See “Multiple Emission Sources” Section VII F.3. Allowable Ambient levels “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1100

^{1,2, 3, etc.} denotes that notated requirement is only applicable to the corresponding notated source.

a. NESHAP: Group IV Polymers and Resins - Materials Preparation Continuous Process Vents

- i. **Regulatory Requirements**
The Permittee shall limit organic HAP emissions from all process vents containing greater than 0.005 weight percent total organic HAP from continuous unit operations associated with the esterification vessels in the collection of raw material preparation sections, as listed above, to no greater than 0.04 kilogram organic HAP per megagram of PET produced from all associated thermoplastic polymer production units. In addition, for the DMT ester exchange alternate operating scenario, the daily average outlet gas stream temperature from each reflux column condenser (ID Nos. CDEVS1, CDEVS2, CDEVS3, and CDEVS4) on ester exchange reactors (ID Nos. EVS1, EVS2, EVS3, and EVS4) at a maximum temperature of 37 degrees F when monomer is produced using DMT and ethylene glycol.
- ii. **Testing**
Emission testing shall be conducted to determine emissions from esterification units. Prior testing is acceptable provided the vent tank exhaust temperature was monitored during the test and an average temperature can be determined for the continuous monitoring maximum parametric value. Emissions from other mix and feed tanks associated with esterification materials preparation may be determined using engineering evaluation and thermodynamic principles.
- iii. **Monitoring Requirements**
"Where a condenser is the final recovery device in the recovery system, a condenser exit (product side) temperature monitoring device equipped with a continuous recorder shall be used." The exit vent stream from each glycol reflux column on each esterification reactor, affected slurry mix tanks and feed tanks shall each be equipped with continuous temperature measuring devices. Continuous monitoring of at least four 15 minute values per hour will be used to compute a daily average temperature that must be below the maximum parametric value temperature established during testing.
- iv. **Recordkeeping Requirements**
The Permittee is required to maintain records of measured parametric values, excursions, monitor maintenance and calibration, equipment malfunctions, start up, shut downs, and other items as may be required in 40 CFR 63.1319.
- v. **Reporting Requirements**
The Permittee is required to report any excursions, equipment malfunctions, and other items as may be required in 40 CFR 63.1320.

b. NESHAP: Group IV Polymers and Resins - Polymerization Continuous Process Vents

- i. Regulatory Analysis
The Permittee shall limit organic HAP emissions from all process vents containing greater than 0.005 weight percent total organic HAP from continuous unit operations in the collection of polymerization reaction sections and ethylene glycol recovery sections, as listed above, to no greater than 0.02 kilogram organic HAP per megagram of PET product, as a whole, from all associated thermoplastic polymer production units.
- ii. Testing
Emission testing shall be conducted to determine emissions from polymerization units after the final recovery/control device. Emissions from ethylene glycol receiver tanks associated with polymerization may be determined using engineering evaluation and thermodynamic principles.
- iii. Monitoring Requirements
"Where a condenser is the final recovery device in the recovery system, a condenser exit (product side) temperature monitoring device equipped with a continuous recorder shall be used." The spray condensers on the polymerizers/finishers shall each be equipped with continuous temperature recording devices.
- iv. Recordkeeping Requirements
The Permittee is required to maintain records of measured parametric values, excursions, monitor maintenance and calibration, equipment malfunctions, start up, shut downs, and other items as may be required in 40 CFR 63.1319.
- v. Reporting Requirements
The Permittee is required to report any excursions, equipment malfunctions, and other items as may be required in 40 CFR 63.1320.

c. NSPS for Equipment Leaks of VOC from the Synthetic Organic Chemical Manufacturing Industry (VV)

Equipment that is subject to 40 CFR 63, Subpart JJJ and the provisions of 40 CFR 60, Subpart VV is required to comply with the provisions of 40 CFR 63 Subpart JJJ as set forth in the permit.

d. NSPS for VOC Emissions from the Synthetic Organic Chemical Manufacturing Industry Distillation Operations (NNN)

a distillation operation that is subject to 40 CFR 63, Subpart JJJ and the provisions of 40 CFR 60, Subpart NNN is required to comply with the provisions of 40 CFR 63 Subpart JJJ as set forth in the permit.

D. WASTEWATER

- ¹ methanol storage and loading scrubber (ID No. CDPR) bleed stream
- ² DMT methanol storage and loading scrubber (ID No. CDML73) bleed stream
- ² ethylene glycol refining area scrubber (ID No. CDGLY1) bleed stream
- ² ethylene glycol refining area scrubber (ID No. CDGLY2) bleed stream
- ¹ fume abator halogen control scrubber (ID No. CDA44) bleed stream
- ³ recovery device (ID No. DCOFC) effluent
- ^{3,4} Y1 barometric tank (ID No. Y1HW)
- ^{3,4} Y2 barometric tank (ID No. Y2HW)
- ^{3,4} Y3 barometric tank (ID No. Y3HW)
- ³ S1 barometric tank (ID No. S1HW)
- ³ S2 barometric tank (ID No. S2HW)
- ³ S3 barometric tank (ID No. S3HW)

³ S4 barometric tank (ID No. S4HW)

³ wastewater retention/equalization/aeration basins, polishing ponds, and clarifiers

1. Description
Wastewater streams are generated by control devices, by steam jet ejectors used to create vacuum for polymerization, and by other miscellaneous operations at the facility.
2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
HAPs ^{1,2}	Wastewater - HON ¹ and JJJ ² a determination shall be made regarding the classification of the wastewater in accordance with the provisions of Section 2.1 D.1. [40 CFR 63.132(c) via 40 CFR 63.1330(b)] for compounds listed in 40 CFR 63, Subpart G Table 9 at HON affected sources; and for methanol, acetaldehyde, and 1,4, dioxane at Polymers and Resins Group IV affected sources.	15A NCAC 2D .1111 (40 CFR 63, Subparts F,G,JJJ)
HAPs ³	Group 2 Wastewater - HON and JJJ Recordkeeping and Reporting in accordance with Section 2.1 D.3 [40 CFR 63.132(b)(4) as prescribed in 40 CFR 63.1330]	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)
VOC ⁴	The ethylene glycol concentration of the water from steam jet vacuums used for the polymerizer reactors of Y1, Y2, and Y3 shall not exceed 0.35 percent by weight (14-day rolling average)	15A NCAC 2D .0524 40 CFR 60, Subpart DDD New Source Performance Standards for VOC from the Polymer Manufacturing Industry
HAPs	See “Multiple Emission Sources” Section VII a.1. General Recordkeeping and Reporting - HON Subpart G	15A NCAC 2D .1111 (40 CFR 63.152)
HAPs	See “Multiple Emission Sources” Section VII B.1. General Applicability , Standards , Recordkeeping and Reporting Provisions - HON Subpart F	15A NCAC 2D .1111 (40 CFR 63.102 and 63.103)
HAPs	See “Multiple Emission Sources” Section VII a.2. HON Subpart G Leak Inspection Provisions	15A NCAC 2D .1111 (40 CFR 63.148)
HAPs	See “Multiple Emission Sources” Section VII C. Equipment Leak Provisions - HON Subpart H	15A NCAC 2D .1111 NESHAP Subpart H
HAPs	See “Multiple Emission Sources” Section VII D. Startup, Shutdown, and Malfunction	15A NCAC 2D .1111 (40 CFR 63.6(e)(3)) NESHAP: Operation and Maintenance Requirements
Odors	See “Multiple Emission Sources” Section VII F.2. Control and Prohibition of Odorous Emissions “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1806

Regulated Pollutant	Limits/Standards	Applicable Regulation
Toxic Air Pollutants	See “Multiple Emission Sources” Section VII F.3. Allowable Ambient levels “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1100

^{1,2, 3, etc.} denotes that notated requirement is only applicable to the corresponding notated source.

^{1,2} **a. Wastewater Group Determinations**

- i. The Permittee is required to determine and report to the DAQ Group 1 or Group 2 status for Table 9 compounds for the HON affected wastewater streams consisting of the methanol storage and loading scrubber (ID No. CDPR) bleed stream , and the fume abator halogen control scrubber (ID No. CDA44) bleed stream.
- ii. The Permittee is required to determine and report to DAQ Group 1 or Group 2 status for methanol, acetaldehyde, and 1,4 dioxane for Subpart JJJ affected wastewater streams consisting of DMT methanol storage and loading scrubber (ID No. CDML73) bleed stream, ethylene glycol refining area scrubber (ID No.CDGLY1) bleed stream, and ethylene glycol refining area scrubber (ID No.CDGLY2) bleed stream.
- iii. The Permittee is required to request revisions to the Title V permit to incorporate Group determinations and any Group 1 control requirements.

³ **b. NESHAP: GROUP IV POLYMERS AND RESINS - GROUP 2 WASTEWATER**

Recordkeeping Requirements

The Permittee shall maintain a record of the following for wastewater.

- i. Each process unit identification and description of each process unit with a wastewater stream.
- ii. Each stream identification code indicating reference to the description of the contributing unit and other data pertaining to its group determination pursuant to 40 CFR 63.144.
- iii. Flow weighted total annual average concentration of acetaldehyde and 1,4 dioxane in parts per million, by weight, determined pursuant to 40 CFR 63.144 at the point of determination for each wastewater stream. Including documentation of the methodology used to determine concentration.

⁴ **c. NSPS For VOC Emissions from the Polymer Manufacturing Industry [Subpart DDD]**

- a. The Permittee is required to maintain the concentration of ethylene glycol in the liquid effluent exiting the vacuum system in the hotwells (ID Nos Y1HW, Y2HW, and Y3HW) servicing the polymerization reaction section at or below 0.35 percent by weight, averaged on a daily basis over a rolling 14-day period of operating days.
- b. Monitoring**
At least one sample per operating day shall be collected and an average ethylene glycol concentration by weight calculated on a daily basis over a rolling 14-day period of operating days.
- c. Recordkeeping**
Daily measurement and daily average 14-day rolling average of the ethylene glycol concentration in the liquid effluent exiting the vacuum system servicing the polymerization reaction section.
- d. Reporting**
The Permittee shall submit a summary report of all periods when the 14-day rolling average exceeded the standard on a semi annual basis.

E. TPA Line No. 1

residue evaporator (ID No. TPA1LUWA) venting to TPA incinerator (ID No. P21).

TPA Line No. 2

residue evaporator (ID No. TPA2LUWA) venting to TPA incinerator (ID No. P21) and TPA process waste extruder (ID No. P22) with spray scrubber (ID No. CDP22).

Terephthalic Acid Handling

line No. 1 north silo (ID No. A15) with fabric filter (ID No. CDA15),
line No. 1 middle silo (ID No. A16) with fabric filter (ID No. CDA16),
line No. 1 truck loading silo (ID No. A16A) with fabric filter (ID No. CDA16A),
line No. 1 south silo (ID No. A17) with fabric filter (ID No. CDA17),
line No. 2 north silo (ID No. A25) with fabric filter (ID No. CDA25),
line No. 2 truck loading silo (ID No. A26A) with fabric filter (ID No. CDA26A),
line No. 2 south silo (ID No. A26) with fabric filter (ID No. CDA26),
truck and railcar remote shipping silo (ID No. A32) with two fabric filters (ID Nos. CDA32A and CDA32B),
truck loading silo (ID No. A33) with two fabric filters (ID Nos. CDA33A and CDA33B),
truck and railcar remote shipping silo (ID No. A32) with two fabric filters (ID Nos. CDA32A and CDA32B),
railcar loading receiver bin (ID No. A34) with fabric filter (ID No. CDA34),
railcar unloading (ID No. A35) with fabric filter (ID No. CDA35),
remote truck loading (ID No. A36) with fabric filter (ID No. CDA36), and
railcar and truck loading receiver bin (ID No. A37) with fabric filter (ID No. CDA37).

Amorphous Chip Processing

chip dryer (ID No. BRCDRY) with fabric filter (ID No. CDDRY),
three chip buffer tanks (ID Nos. BRGBT1, BRGBT2, BRGBT3) with fabric filter (ID No. CDCBT), and
four amorphous chip silos (ID Nos. BRCS1 through BRCS4) with fabric filters (ID Nos. CDCS1 through CDCS4).

Solid State Polymerization

amorphous railcar chip loadout (ID No. BRSSPCRL) with fabric filter (ID No. CDSSPCRL),
precrystallizer feed bin (ID No. BRSSPFB) with fabric filter (ID No. CDSPPFB),
post consumer recycle bin (ID No. BRPCR) with fabric filter (ID No. CDPCR),
precrystallizer (ID No. BRSSPCRY) with fabric filter two units (ID No. CDSPPCRYA and CDSSPCRYB),
chip dryer with integral cyclone (ID No. BRSSPDY),
dryer conveyor (ID No. BRSSPDC) with fabric filter (ID No. CDSSPDC),
product deduster (ID No. BRSSPPD) with fabric filter (ID No. CDSSPPD),
four product silos (ID Nos. BRPS1 through BRPS4) with fabric filters (ID Nos. CDSSPPS1 through CDSSPPS4),
railcar drop pots (ID No. BRSSPPRL) with fabric filter (CDSSPPS4), and
railcar silo (ID No. BRSSPPRS) with railcar silo (ID No. CDSSPPRS).

Continuous Processing - Staple Resin Polymerization

three DMT storage tanks (ID Nos. ML14A, ML14B, and ML14C).
eight spinning operations (ID Nos ML11A through ML11H) with demisters (ID Nos. CDML11A through ML11H), and
eight draw machines/heated staple relaxers (ID Nos. ML33A through ML33H).

1. Description

Each of these area handles product, recovered, or waste material as indicated. Amorphous chip is polyester chip prior to solid state polymerization. Solid state polymerization is where the polymer is hardened by decreasing interstitial space in the polymer cross links by removing ethylene glycol molecules from the interconnection polymer chains while it is in a solid state.

2. Applicable Regulatory Requirements

The following table provides a summary of limits and standards for the emission source(s) described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate Matter	particulate emissions shall not exceed the rate prescribed by the process weight equations: For process rates up to 30 tons per hour: $E = 4.10 \times P^{0.67}$ For process rates greater than 30 tons per hour: $E = 55.0 \times P^{0.11} - 40$ Where: E = allowable emission rate in pounds per hour, and P = process weight in tons per hour	15A NCAC 2D .0515
Visible Emissions	visible emissions shall not exceed 20 percent opacity	15A NCAC 2D .0521
Volatile Organic Compounds	See “Multiple Emission Sources” Section VII F.1. Work Practice Standards	15A NCAC 2D .0958
Odors	See “Multiple Emission Sources” Section VII F.2. Control and Prohibition of Odorous Emissions “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1806
Toxic Air Pollutants	See “Multiple Emission Sources” Section VII F.3. Allowable Ambient levels “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1100

a. 15A NCAC 2D .0515: PARTICULATES FROM MISCELLANEOUS INDUSTRIAL PROCESSES

- i. Emissions of particulate matter from each source shall not exceed an allowable emission rate as calculated by the following process weight equations.
 For process rates up to 30 tons per hour: $E = 4.10 \times P^{0.67}$
 For process rates greater than 30 tons per hour: $E = 55.0 \times P^{0.11} - 40$
 Where: E = allowable emission rate in pounds per hour, and P = process weight in tons per hour
 These sources were recently evaluated for compliance in construction permit R31
- ii. Monitoring/Recordkeeping
 Inspection and maintenance of control equipment is required to maintain compliance. The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request.
- iii. Reporting
 Semi annual reporting is required of maintenance and deviations in recordkeeping requirements.

b. 15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

- i. Visible emissions from each of the sources listed above shall not be more than 20 percent opacity.
- ii. Monitoring
 Monthly opacity observations are required with the exception of the process waste extruder (ID No. P22), the bottle resin chip dryer (ID No. BRCDRY), the bottle resin precrystallizer (ID No. BRSSPCRY), the bottle resin product deduster (ID No. BRSSPPD),

the eight spinning operations (ID Nos ML11A through ML11H), and the eight draw machine/heater staple relaxers (ID Nos . ML33A through ML33H) which shall me monitored weekly.

- iii. Recordkeeping
The results of the monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request.
- iv. Reporting
Semi annual reporting of exceedances and deviations from monitoring and recordkeeping is required.

F. Utilities - Industrial Solid Waste Incineration Unit

Line No. 2 TPA waste incinerator (ID No. P12) with fabric filter (ID No. CDP21)

- 1. Description
This incinerator disposes of non hazardous solid waste created during the production of TPA. Some rare metal remains in the ash from the catalyst. However, the incinerator is not intended for recovery of this metal.
- 2. Applicable Regulatory Requirements
The following provides a summary of limits and/or standards for the emission source(s) described above.

Regulated Pollutant	Limits/Standards	Applicable Regulation
PM	emissions shall not exceed 70 milligrams per dry standard cubic meter (0.0306 grains per cubic foot) corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(1)
visible emissions	emissions shall not exceed 10 percent opacity	15A NCAC 2D .1210(c)(2)
sulfur dioxide	emissions shall not exceed 20 ppmv corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(3)
nitrogen oxides	emissions shall not exceed 368 ppmv corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(4)
carbon monoxide	emissions shall not exceed 157 ppmv corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(5)
odor	Comply with 'Control and Prohibition of Odorous Emissions" 15A NCAC 2D .1086 “STATE ENFORCEABLE ONLY” See "Multiple Emission Sources", Section VII F.2	15A NCAC 2D .1210(c)(6)
hydrogen chloride	emissions shall not exceed 62 ppmv corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(7)
mercury	emissions shall not exceed 470 micrograms per dry standard cubic meter (2.05 x10 ⁻⁵ grains per cubic foot) corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(8)
lead	emissions shall not exceed 40 micrograms per dry standard cubic meter (1.748 x 10 ⁻⁵ grains per cubic foot) corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(9)

Regulated Pollutant	Limits/Standards	Applicable Regulation
cadmium	emissions shall not exceed 4 micrograms per dry standard cubic meter (1.748×10^{-6} grains per cubic foot) corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(10)
dioxins/furans	toxic equivalent emissions shall not exceed 410 picograms per dry standard cubic meter (1.792×10^{-10} grains per cubic foot) corrected to seven percent oxygen (dry basis)	15A NCAC 2D .1210(c)(11)
toxic air pollutants	Comply with "Control of Toxic Air Pollutants" 15A NCAC 2D .1100 and "Toxic Air Pollutant Procedures" 15A NCAC 2Q .0700 “STATE ENFORCEABLE ONLY” See "Multiple Emission Sources", Section VII F.3.	15A NCAC 2D .1210(c)(12)
arsenic beryllium cadmium chromium	Annual average ambient concentration standards for all incinerators at the facility shall not exceed those allowable ambient levels set forth in "Control of Toxic Air Pollutants" 15A NCAC 2D .1100. “STATE ENFORCEABLE ONLY” See "Multiple Emission Sources", Section VII F.3.	15A NCAC 2D .1210(c)(13)

a. 15A NCAC 2D .1210: Commercial and Industrial Solid Waste Incineration (CISWI) Units

- i. Emissions Standards/Control Requirements
Emissions standards are listed in the table above.
- ii. Operational Standards
The fabric filter control device (ID No. CDP21) on TPA incinerator (ID No. P21) shall be equipped with a bag leak detection system with an alarm. The Permittee must operate the fabric filter system such that the bag leak detection system alarm does not sound more than five percent of the operating time during a six-month period.
- iii. Testing
Initial and annual compliance testing is required. The initial compliance test to must be conducted no later than July 1, 2006.
- iv. Monitoring
 - (a) The Permittee is required to establish, install, calibrate to manufacturers specifications, maintain, and operate devices or methods for continuous temperature monitoring and recording for the primary chamber and, where there is a secondary chamber, for the secondary chamber.
 - (B) The Permittee is required to establish, install, calibrate to manufacturers specifications, maintain, and operate bag leak detection systems.
 - (C) The Permittee shall install, operate, and maintain continuous monitors for oxygen or for carbon monoxide or both as necessary to determine proper operation of the TPA incinerator (ID No. P21).
- v. Recordkeeping
The Permittee shall maintain records of required monitoring on site in either paper copy or electronic format of:
 - (a) the CISWI unit charge dates, times, weights, and hourly charge rates;

- (B) the date, time, and duration of each fabric filter bag leak alarm and corrective action measures;
 - (C) Identification of calendar dates and times for which monitoring systems used to monitor operating limits were inoperative, inactive, malfunctioning, or out of control;
 - (D) Identification of calendar dates, times, and durations of malfunctions, and a description of the malfunction and the corrective action taken.
 - (E) The results of the initial, annual, and any subsequent performance tests conducted to determine compliance with the emission limits and/or to establish operating limits, as applicable. Retain a copy of the complete test report including calculations.
 - (F) Records showing the names of CISWI unit operators who have completed review of the operator training materials, including the date of the initial review and all subsequent annual reviews;
 - (G) records showing the names of the CISWI operators who have completed the operator training and qualification requirements;
 - (F) the phone and/or pager number at which each qualified operator can be reached during operating hours;
 - (H) records of calibration of any monitoring devices;
 - (I) equipment vendor specifications and related operation and maintenance requirements for the incinerator, emission controls, and monitoring equipment; and
 - (J). keep a log of the quantity of waste burned and the types of waste burned on a daily basis.
- v. Reporting
The Permittee shall submit the following reports.
- (a) Waste management Plan on or before December 1, 2003.
 - (B) The initial test report not later than August 30, 2006, and documentation that a bag leak detection system is installed, operating, calibrated, and maintained.
 - (C) An annual report including certification of accuracy, corrective actions, bag leak alarm incidents, monitoring equipment operation, results of any compliance testing, and documentation of qualified operator availability.
 - (D) Emission limitation or operating limit deviation report for any pollutant or parameter that deviated from the emission limitations or operating limits
 - (E) If all qualified operators are not accessible for two weeks or more, The Permittee must submit a notification of the deviation within 10 days; a status report to the DAQ every four weeks that includes a description of what you are doing to ensure that a qualified operator is accessible, the date when you anticipate that a qualified operator will be accessible, and a request for approval from the DAQ to continue operation of the CISWI unit; and if your unit was shut down by the DAQ due to a failure to provide an accessible qualified operator, you must notify the DAQ that you are resuming operation once a qualified operator is accessible.
 - (F) The Permittee is required to submit a deviation report if the bag leak detection system alarm sounds for more than five percent of the operating time for the six-month reporting period; or a performance test was conducted that deviated from any emission standards.
- vi. Excess Emissions and Start-up and Shut-down.
All incinerators subject to this Rule shall comply with 15A NCAC 2D .0535, Excess Emissions Reporting and Malfunctions, of this Subchapter.
- vii. Operator Training and Certification.
The Permittee can not allow the CISWI unit to operate at any time unless a fully trained and qualified CISWI unit operator is accessible, either at the facility or available within one hour. The trained and qualified CISWI unit operator may operate the CISWI unit directly or be the direct supervisor of one or more CISWI unit operators.
- viii. Waste Management Plan

The Permittee must submit a waste management plan that identifies in writing the feasibility and the methods used to reduce or separate certain components of solid waste from the waste stream in order to reduce or eliminate toxic emissions from incinerated waste. a waste management plan shall be submitted to the Director before December 1, 2003.

ix. Compliance Schedule.

The Permittee, which plans to achieve compliance after November 30, 2003, shall submit before December 1, 2003, along with the permit application, the final control plan for the CISWI unit. The final compliance shall be achieved no later than December 1, 2005.

G. Utilities

- Boiler No. 1 (ID No. ES01) with fabric filter (ID No. CD01)
- Boiler No. 2 (ID No. ES02) with fabric filter (ID No. CD02)
- Dowtherm heater No. 5 (ID No. ES05)
- Dowtherm heater No. 6 (ID No. ES06)
- monomer boiler No. 7 (ID No. ES07)
- monomer boiler No. 9 (ID No. ES09)
- monomer boiler No. 10 (ID No. ES10)
- Dowtherm vaporizer No. 11 (ID No. ES11)
- Dowtherm vaporizer No. 12 (ID No. ES12)
- Dowtherm vaporizer No. 13 (ID No. ES13)
- Dowtherm vaporizer No. 14 (ID No. ES14)
- Fume abator with heat recovery (ID No. CDA43) **NSPS Dc**

1. Description
 These are boilers and process heaters for the facility with the exception of the fume abator which is a control device with heat recovery.
2. Applicable Regulatory Requirements

The following table provides a summary of limits and standards for the emission source(s) described above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Particulate Matter	<p>Particulate matter emissions shall not exceed 0.166 pounds per million Btu heat input for boilers No. 1 and No. 2 (ID Nos. ES01 and ES02); monomer boilers No. 1, No. 2, and No. 4 (ID Nos. ES07, ES09, and ES10); Dowtherm heaters No. 3 and No. 4 (ID Nos. ES05 and ES06); and Dowtherm vaporizers No. 1, No. 2, No. 3, and No. 4 (ID Nos. ES11, ES12, ES13, and ES14)</p> <p>Particulate matter emissions shall not exceed 0.165 pounds per million Btu heat input for fume abator (ID No. CDA43)</p>	15A NCAC .0503
Sulfur Dioxide	sulfur dioxide emissions shall not exceed 2.3 pounds per million Btu heat input	15A NCAC .0516

Regulated Pollutant	Limits/Standards	Applicable Regulation
Visible Emissions	<p>visible emissions shall not exceed 20 percent opacity for boilers No. 1 and No. 2 (ID Nos. ES01 and ES02); monomer boilers No. 1, No. 2, and No. 4 (ID Nos. ES07, ES09, and ES10); Dowtherm heaters No. 3 and No. 4 (ID Nos. ES05 and ES06); and fume abator (ID No. CDA43)</p> <p>visible emissions shall not exceed 40 percent opacity for Dowtherm vaporizers No. 1, No. 2, No. 3, and No. 4 (ID Nos. ES11, ES12, ES13, and ES14)</p>	15A NCAC 2D .0521
fuel use	The auxiliary fuel combusted in this unit is limited to natural gas and propane. Recordkeeping of the type of fuel combusted in this unit is required.	15A NCAC 2D .0524 (40 CFR 60, Subpart Dc) New Source Performance Standards for Commercial-Industrial-Institutional Steam Generating Units
<p>PM</p> <p>sulfur dioxide</p> <p>nitrogen oxides</p>	<p>PSD avoidance condition [addition of coal boilers (ID Nos. ES01& ES02)]</p> <p>Particulate emissions from the coal boilers (ID Nos ES01 and ES02) shall not exceed 0.1 pounds per million Btu heat input.</p> <p>Particulate emissions from the monomer boilers (ID Nos. ES07, ES09, and ES10), the Dowtherm heaters (ID Nos. ES05 and ES06) and the Dowtherm vaporizers (ID Nos. ES11, ES12, ES13, and ES14) shall not exceed 0.16 pounds per million Btu heat input.</p> <p>Sulfur dioxide emissions from the coal boilers (ID Nos ES01 and ES02) shall not exceed 2.2 pounds per million Btu heat input.</p> <p>Nitrogen oxides emissions from the coal boilers (ID Nos ES01 and ES02) shall not exceed 0.7 pounds per million Btu heat input at heat input rates less than or equal to 190 million Btu per hour; and 0.95 pounds per million Btu heat input at heat input rates greater than 190 million Btu per hour.</p>	15A NCAC 2Q. 0317
Sulfur Dioxide	emissions from the coal boilers (ID Nos ES01 and ES02); the monomer boilers (ID Nos. ES07, ES09, and ES10), the Dowtherm heaters (ID Nos. ES05 and ES06) and the Dowtherm vaporizers (ID Nos. ES11, ES12, ES13, and ES14) shall not exceed 10,284 tons per year.	15A NCAC 2Q. 0317
Toxic Air Pollutants	See “Multiple Emission Sources” Section VII F. Allowable Ambient levels “STATE ENFORCEABLE ONLY”	15A NCAC 2D .1100

- a. 15A NCAC 2D .0503: Particulates from Fuel Burning Indirect Heat Exchangers**
- i. Emissions of particulate matter emissions shall not exceed 0.166 pounds per million Btu heat input for boilers No. 1 and No. 2 (ID Nos. ES01 and ES02); monomer boilers No. 1, No. 2, and No. 4 (ID Nos. ES07, ES09, and ES10); Dowtherm heaters No. 3 and No. 4 (ID Nos. ES05 and ES06); and Dowtherm vaporizers No. 1, No. 2, No. 3, and No. 4 (ID Nos. ES11, ES12, ES13, and ES14). Particulate matter emissions shall not exceed 0.165 pounds per million Btu heat input for fume abator (ID No. CDA43)
 - ii. Monitoring [15A NCAC 2Q .0508(f)]
Inspection and maintenance of fabric filter systems on boilers No. 1 and No. 2 (ID Nos ES01 and ES02) is required.
 - iii. Recordkeeping
The results of inspection and maintenance shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request.
 - iv. Reporting
Semi annual reporting of any maintenance performed on a fabric filter system and any deviations from the recordkeeping provision is required
- b. 15A NCAC 2D .0516: Sulfur Dioxide Emissions from Combustion Sources**
- i. Emissions of sulfur dioxide from the combustion units shall not exceed 2.3 pounds per million Btu heat input.
 - (a) The maximum sulfur content of any coal received and burned in the boiler shall not exceed 1.5 percent by weight.
 - (B) The maximum sulfur content of any No. 6 fuel oil received and burned in the combustion units shall not exceed 2.1 percent by weight.
 - ii. Monitoring/Recordkeeping
 - (a) No monitoring/recordkeeping is required for sulfur dioxide emissions from natural gas for these sources.
 - (B) The Permittee is required to monitor the sulfur content of the coal and of the No. 6 fuel oil by using fuel oil.
 - iii. Reporting
The Permittee shall submit a semi annual reports of summary report of the coal supplier and fuel oil supplier certifications.
- c. 15A NCAC 2D .0521: Control of Visible Emissions**
- i. Visible emissions from boilers No. 1 and No. 2 (ID Nos. ES01 and ES02); monomer boilers No. 1, No. 2, and No. 4 (ID Nos. ES07, ES09, and ES10); Dowtherm heaters No. 3 and No. 4 (ID Nos. ES05 and ES06); and fume abator (ID No. CDA43) shall not be more than 20 percent opacity when averaged over a six-minute period. Visible emissions from Dowtherm vaporizers No. 1, No. 2, No. 3, and No. 4 (ID Nos. ES11, ES12, ES13, and ES14) shall not be more than 40 percent opacity when averaged over a six-minute period.
 - ii. Monitoring
Daily opacity observations are required during the combustion of coal or No. 6 fuel oil. No monitoring/recordkeeping/reporting is required for visible emissions from the firing of natural gas or No. 2 fuel oil.

- iii. Recordkeeping
The results of the opacity observation monitoring shall be maintained in a logbook (written or electronic format) on-site and made available to an authorized representative upon request.
 - iv. Reporting
Semi annual reports of a summary report of the observations are required.
- d. 15A NCAC 2D .0524: NSPS 40 CFR Part 60 Subpart Dc**
The Permittee is required to record and maintain records of the amounts of each fuel fired during each day. No reporting is required.
- e. 15A NCAC 2Q .0317: PSD AVOIDANCE CONDITION**
- i. Total sulfur dioxide emissions from coal boilers , monomer boilers, Dowtherm heaters, and Dowtherm vaporizers must be less than 10,284 tons per 12 consecutive month period.
 - ii. Monitoring/Recordkeeping
 - (a) The Permittee shall maintain records of the amount of bituminous coal burned and the sulfur content by weight, and the amount of No. 6 fuel oil burned and the sulfur content by weight.
 - (B) The Permittee shall calculate each month the amount of sulfur dioxide emitted, using fuel use records, US EPA “Compilation of Air Pollution Emission Factors” (AP-42) and actual sulfur content.
 - (C) The Permittee shall calculate the rolling annual total sulfur dioxide emissions for a consecutive 12 month period and maintain all records used in the calculation on site and made available for inspection by the DAQ on request.
 - iii. Reporting
Quarterly reports of the rolling annual total sulfur dioxide emissions for each of the three months of the quarter along with the monthly sulfur dioxide emissions use for the 14 months used to calculate the three rolling annual totals.

VII. Multiple Emission Source Limits

a. Facility Wide - HON Affected Sources Pursuant to 40 CFR 63, Subpart G

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	General Recordkeeping and Reporting	15A NCAC 2D .1111 (40 CFR 63, Subpart G)
Hazardous Air Pollutants	Equipment Leak Provisions	15A NCAC 2D .1111 (40 CFR 63, Subpart G)

1. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCM I General Recordkeeping and Reporting Provisions

These provisions are verbatim of the requirements of 40 CFR 63.152 as they apply to the affected sources at this facility.

2. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCM I Equipment Leak Provisions

These provisions are verbatim of the requirements of 40 CFR 63.148 as they apply to the affected sources at this facility.

B. Facility Wide - HON Affected Sources Pursuant to 40 CFR 63, Subpart F

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	General Compliance, Recordkeeping and Reporting.	15A NCAC 2D .1111 (40 CFR 63, Subpart F)
Hazardous Air Pollutants	Heat Exchanger system monitoring.	15A NCAC 2D .1111 (40 CFR 63, Subpart F)
Hazardous Air Pollutants	Maintenance wastewater management procedures	15A NCAC 2D .1111 (40 CFR 63, Subpart F)

1. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCM I General Compliance Recordkeeping and Reporting Provisions

These provisions are verbatim of the requirements of 40 CFR 63.102 and 40 CFR 63.103 as they apply to the affected sources at this facility.

2. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCM I Heat Exchanger System Monitoring

These provisions are verbatim of the requirements of 40 CFR 63.104 as they apply to the affected sources at this facility.

3. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCM I Maintenance Wastewater Requirements

These provisions are verbatim of the requirements of 40 CFR 63.105 as they apply to the facility.

C. Facility Wide - HON Affected Sources Pursuant to 40 CFR 63, Subpart H

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	Equipment Leak Detection and Repair.	15A NCAC 2D .1111 (40 CFR 63, Subpart H)

1. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCMII Equipment Leak Detection and Repair

These provisions are verbatim of the requirements of 40 CFR 63.160 through 40 CFR 63.182 as they apply to the affected sources at this facility.

D. Facility Wide - MACT Affected Sources

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	Startup, Shut down, and Malfunction Plan Requirements	15A NCAC 2D .1111 (40 CFR 63)

1. 15A NCAC 2D .1111: NESHAP: HAPs from the SOCMII MACT General Provisions

These provisions are verbatim of the requirements of 40 CFR 63.6(e)(3) as specifically required by regulation for affected sources at this facility.

E. Facility Wide - Affected Units Pursuant to 40 CFR 63, Subpart JJJ

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Hazardous Air Pollutants	General Recordkeeping and Reporting	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)
Hazardous Air Pollutants	Maintenance Wastewater Requirements	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)
Hazardous Air Pollutants	Heat Exchangers	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)
Hazardous Air Pollutants	Equipment Leak Provisions	15A NCAC 2D .1111 (40 CFR 63, Subpart JJJ)

**1. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS
GENERAL RECORDKEEPING AND REPORTING PROVISIONS**

These provisions are verbatim of the requirements of 40 CFR 63.1335 as they apply to the affected sources at this facility.

**2. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS
MAINTENANCE WASTEWATER REQUIREMENTS**

These provisions are verbatim of the requirements of 40 CFR 63.105 as modified by 40 CFR 63.1330(c) (i.e., HAPs include only acetaldehyde and 1,4 dioxane).

**3. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS
HEAT EXCHANGER REQUIREMENTS**

These provisions are verbatim of the requirements of 40 CFR 63.104 as modified by 40 CFR 63.1328 (e.g., HAPs include only acetaldehyde and 1,4 dioxane).

**4. 15A NCAC 2D .1111: NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANT EMISSIONS: GROUP IV POLYMERS AND RESINS
EQUIPMENT LEAK PROVISIONS [40 CFR 63.1331(b)]**

These provisions are verbatim of the requirements of 40 CFR 63.1331(b) which assumes that all affected sources are either in vacuum or heavy liquid service (i.e., exempt). This is based on the premise that there are no streams in HAP service that handle any HAP except ethylene glycol, a heavy liquid.

F. Facility Wide

The following table provides a summary of limits and standards for the emission source(s) describe above:

Regulated Pollutant	Limits/Standards	Applicable Regulation
Volatile Organic Compounds	Work Practice Standards	15A NCAC 2D .0958
odor	State Enforceable Only Control Requirements	15A NCAC 2D .1806
TAPs	State Enforceable Only Allowable emission rates determined to meet acceptable ambient standards	

1. 15A NCAC 2D .0958: Work Practices for Sources of Volatile Organic Compounds

- i. Regulatory Analysis
All sources that use volatile organic compounds (VOC) whose emissions of VOC are greater than 15 pounds per day are required to employ specific work practice standards.
- ii. Monitoring
Monthly visual inspection of all operations and processes utilizing volatile organic compounds is required to ensure that work practices are being employed.
- iii. Recordkeeping

The results of the inspections shall be maintained in a logbook which shows the date and time of each inspection and the results of each inspection noting whether or not noncompliant conditions were observed.

- iv. Reporting
Semi annual reports of observations is required.

State-only Requirement:

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

The Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

State-only Requirement:

- 3. Toxic Air Pollutant Emissions Limitation and Requirement** - Pursuant to 15A NCAC 2D .1100 and in accordance with the approved application for an air toxic compliance demonstration, emission rate were established for emissions of acetaldehyde and 1,4,dioxane from specific emission sources. Facility wide TPA emission limitations are provided for acetic acid, ammonia, arsenic and arsenic compounds, benzene, beryllium, cadmium, chromium VI, ethylene glycol monoethyl ether, formaldehyde, hydrogen fluoride, hydrogen chloride, manganese, mercury (inorganic and aryl compounds), nickel, toluene, xylene, and tetrachlorodibenzo-p-dioxin. It is assumed that specific emission sources were modeled to establish the facility wide emission rates; however, no documentation could be located regarding the modeling to convert the facility wide emission rates into source specific emission rates to ensure the validity of the modeling analysis. The demonstration of compliance for TAP emissions does not allow for a facility wide TPA emission cap.

In addition to emissions limits, the Permittee is required to estimate benzene emissions, limit No. 6 fuel oil used in monomer boilers (ID Nos. ES7, ES9, and ES10), provide for 98% control of benzene from the fume abator, estimate chromium VI emissions from the incinerator, and estimate acetic acid from wastewater treatment. As a part of 15A NCAC 2D.1210 applicability, a determination of specific emission rates from the TPA incinerator must be made for arsenic, beryllium, cadmium, chromium VI, and the respective compounds of these metals by the end of 2005.

VIII. Permit Shield (including non-applicable requirements)

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. If the permit does not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

IX. General Conditions

The "General Conditions" section of the Title V Operating Permits lists additional applicable rule requirements that the permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

X. Insignificant Activities

The insignificant activities listed in the application have been reviewed and verified. Because an emission source or activity is insignificant does not mean that the emission source or activity is exempted from any applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement. Insignificant activities were determined to be as follows:

1. catalyzed glycol tanks (ID Nos. ML7A,B, D, E, F, and G)
2. water/KP-33, 2% tank (ID No. ML7C)
3. TEG tanks (ID Nos. ML9A, B)
4. water/caustic 8%/acetic acid 12% tanks (ID Nos. ML16A and B)

5. water/DS-11/12; N-7768; N-8795; cellulose tanks (ID Nos. ML17A, B, and C)
6. DS-(xx) tanks (ID No. ML28, ML105A, B, C, D, E, F, G, H, ML106B, C, D, E, F, G, H, and M)
7. waste liquid storage for incineration (ID No. ML29)
8. catalyzed glycol mix tanks (ID Nos. ML30A, B, C, D, E, and F)
9. antimony trioxide/glycol tanks (ID Nos. ML31 and ML183)
10. KP-33: 2% in virgin tank (ID No. ML34)
11. misc. glycols tank (ID No. ML38)
12. DY-(xx) tanks (ID No. ML24, ML39, ML55A, B, ML87, ML88, ML101C, ML106A, and ML162)
13. caustic in glycol tanks (ID Nos. ML40 and ML86)
14. glycol/TiO₂ tanks (ID Nos. ML41A, B, C, D, E, F, G, ML42A, B, C, ML94, ML95, ML96, and ML144)
15. waste liquid storage tanks for ECP incinerators (ID Nos. ML47 and ML48)
16. Dowtherm vacuum pump liquid separation tanks (ID Nos. ML49A, B, and C)
17. Fibers railcar glycol loading rack (ID No. ML50)
18. Dowtherm tanks (ID No. ML56, ML57, ML58, and S-17)
19. NaCl (brine), glycol, water tanks (ID Nos. ML59, ML182A, B, C, D, E, and F)
20. bottom ash silo (ID No. ML72)
21. TEG tank (ID No. ML74)
22. spent glycol tanks (ID No. ML75, ML771, and ML772)
23. virgin glycol tanks (ID No. ML76, ML169A, B, C, and D)
24. glycol, TiO₂, KP(xx) tanks (ID Nos. ML90A, B, C, ML91A and B, ML92A, B, C, D, E, F, ML93A, and B)
25. refined glycol tanks (ID No. ML97 and ML142)
26. HPO₃/glycol tanks (ID Nos. ML98, ML99, ML203, and ML204)
27. finish oil/DY19 tanks (ID Nos. ML100A, ML151A, and ML151B)
28. water/DS-(xx) tanks (ID Nos. ML100C, E, ML101A, B, D, E, K, ML106N, P, ML111A, B, C, D, ML118A, B, C, and D)
29. antifreeze/water tanks (ID Nos. ML112A, B, and C)
30. water/DY-19 tanks (ID Nos. ML116, ML140 a, B, C, D, E, F, G, H, J, K, L, M, N, P, R, S, T, ML153B, C, and ML154)
31. flyash silo (ID No. ML126)
32. four coal silos (ID No. ML128)
33. recycle glycol tanks (ID No. ML143, ML43A, B, C, D, E, and ML79)
34. DY-39/Kathon tank (ID No. ML149F)
35. LIQ 364 tanks (ID No. ML157) OUT OF SERVICE
36. glycol/DRL-6 tank (ID No. ML159)
37. waste finish/DY-19 tank (ID No. ML160)
38. glycol tanks (ID Nos. ML172A, B, C, ML185A, B, C, and D)
39. water/misc. VOC tanks (ID Nos. ML190 and ML191)
40. butanol storage tank (ID No. S-16)
41. diethylaminoethanol storage tanks (ID Nos. S-42 and S-44)
42. IPA silo (ID No. BRIPAS) with fabric filter
43. waste non degradable finish tank (ID No. ML106J)
44. ethylene glycol/DRL6 storage tank; 19,500 gallon capacity (ID No. ML27) **NSPS Kb**
45. ethylene glycol/KP33 storage tank; 25,000 gallon capacity (ID No. ML36) **NSPS Kb**
46. ethylene glycol/KP1 storage tank; 40,000 gallon capacity (ID No. ML78) **NSPS Kb**
47. urea storage tank; 16,600 gallon capacity (ID No. S14)
48. DMT power house fuel oil storage tank (ID No. S12)
49. DMT phosphoric acid storage tank (ID No. S15)
50. coal fired boiler fuel oil storage tank (ID No. S40)
51. cobalt slurry storage tank (ID No. S52)
52. gasoline storage tanks (ID No. S53 and unknown)
53. three diesel storage tanks (ID No. S58 and two unknown)
54. remote fuel oil storage tank (ID No. S59)
55. four No. 6 fuel storage tanks; intermediates, supply, and two day tanks
56. four No. 2 fuel oil storage tanks including fire grounds and incinerator
57. aluminum sulfate storage tank
58. sulfuric acid storage tank

59. fourteen caustic storage tanks; three-20, 50, 1st floor supply, 1st floor makeup, S11, north/south/#4 demineralizer, fresh water pond, two jet water, and one other unknown
60. ammonium hydroxide storage tank
61. five phosphoric acid storage tanks; two staple, two yarn, and unknown
62. hydrogen peroxide storage tank
63. twelve 1st floor oil based tanks; two storage, three mix, weigh, and six sonic
64. alum day tank
65. three demineralizer tanks; north south, and #3
66. four BETZ tanks; optimeen, sulfite/oxygen scavenger, balanced polymer, and regenameen
67. two propane tanks; power
68. ethylene glycol/KP10 storage tank; 25,000 gallon capacity (ID No. ML15) **NSPS Kb**
69. ethylene glycol dump tank; 175,000 gallon capacity (ID No. PR11)
70. aerosol can paint spray booth (ID No. SB1)

XI. Public Notice

Pursuant to 15A NCAC 2Q .0521, a notice of the Title V Operating Permit shall be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30 day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA.

XII. Recommendations

The initial Title V application for Alcoa Inc. has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the proposed permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.