Troy Chemical Corp (05459)

Date: 1/7/2025

New Jersey Department of Environmental Protection
Reason for Application

Permit Being Modified

Permit Class: PCP **Number:** 20001

Description of Modifications:

Troy Chemical Corp is submitting this application to revise PCP020001 in order to streamline operations by combining multiple permits into one pre-construction permit covering all manufacturing operations occuring in Building 61 (per NJDEP's present requirements), update the permit to current nomenclature and align the permit more closely with current operations.

As part of this application to modify PCP020001, please update nomenclature within the permit to match current facility nomenclature as follows:

Change the emission unit number from "U610100" to "U6101"

Change the Emission Unit description from "R-6101 System" to "Building 61 Manufacturing Process"

Change the equipment number: "E610100" to "E6101",

Change the equipment description of E6101 from "Vessel R-6101 System: multi-purpose, glass lined jacketed vessel (includes condenser 1, T-6101A, vacuum steam jet, condenser 2, T-6101B, T-6101C)" to "R-6101 system including E-6101, E6101A, E-6101B, E-6101C, E-6101D, T-6101A, T-6101C, and glass receiver"

Renumber "PT610100" to "PT6101"

Remove Operating Scenarios OS1, OS2 and OS3 from the permit.

Additionally, please cancel the following permits: PCP170003, and PCP960039 as all equipment on these permits will now be part of this revised permit anticipated to be called PCP240002.

An air flow block diagram and calculations are attached for all operating scenarios. All HAP emissions remain below reporting thresholds and are listed on the raw materials list for each applicable operating scenario.

The facility anticipates that the application fee for this permit revision will be $5,490 consisting of the first source at $2,540 and five additional sources at $590 each.

If there are any questions regarding this application, please contact Troy's consultant Dean Koncsol of Baron Environmental Associates at (908) 508-9000 or dean.koncsol@baronenv.com.

New Jersey Department of Environmental Protection
Facility Profile (General)

Facility Name (AIMS): Troy Chemical Corp

Facility ID (AIMS): 05459

Street Address: ONE AVE L
NEWARK, NJ 07105

Mailing Address: ONE AVE L
NEWARK, NJ 07105

State Plane Coordinates:

X-Coordinate:

Y-Coordinate:

Units:

Datum:

Source Org.:

Source Type:

County: Essex

Location Description:

Industry:

Primary SIC:

Secondary SIC:

NAICS: 325510

New Jersey Department of Environmental Protection
Facility Profile (General)

Contact Type: Air Permit Information Contact

Organization: Troy Chemical Corp
Org. Type: Private
Name: Harry Chen
NJ EIN: 22230683000
Title: EH&S Specialist
Phone: (973) 589-2500 x
Mailing Address: One Avenue L
Newark, NJ 07105
Fax: ( ) - x
Other: ( ) - x
Type:
Email: chenh@arxada.com

Contact Type: Fees/Billing Contact

Organization: Troy Chemical Corp
Org. Type: Private
Name: Harry Chen
NJ EIN: 22230683000
Title: EH&S Specialist
Phone: (973) 589-2500 x
Mailing Address: One Avenue L
Newark, NJ 07105
Fax: ( ) - x
Other: ( ) - x
Type:
Email: chenh@arxada.com

Contact Type: Responsible Official

Organization: Troy Chemical Corp
Org. Type: Private
Name: Agib Pierre Louis
NJ EIN: 22230683000
Title: Site Director
Phone: (973) 589-2500 x
Mailing Address: One Avenue L
Newark, NJ 07105
Fax: ( ) - x
Other: ( ) - x
Type:
Email: agib.pierrelouis@arxada.com

New Jersey Department of Environmental Protection
Facility Profile (Permitting)

1. Is this facility classified as a small business by the USEPA?	No
2. Is this facility subject to N.J.A.C. 7:27-22?	No
3. Are you voluntarily subjecting this facility to the requirements of Subchapter 22?	No
4. Has a copy of this application been sent to the USEPA?	No
5. If not, has the EPA waived the requirement?	No
6. Are you claiming any portion of this application to be confidential?	No
7. Is the facility an existing major facility?	No
8. Have you submitted a netting analysis?	No
9. Are emissions of any pollutant above the SOTA threshold?	No
10. Have you submitted a SOTA analysis?	No
11. If you answered "Yes" to Question 9 and "No" to Question 10, explain why a SOTA analysis was not required	
12. Have you provided, or are you planning to provide air contaminant modeling?	No

Troy Chemical Corp (05459)

Date: 01/07/2025

New Jersey Department of Environmental Protection
Non-Source Fugitive Emissions

FG NJID	Description of Activity Causing Emission	Location Description	Reasonable Estimate of Emissions (tpy)								
			VOC (Total)	NOx	CO	SO	TSP (Total)	PM-10	Pb	HAPS (Total)	Other (Total)
FG1											
Total											

New Jersey Department of Environmental Protection
Equipment Inventory

Equip. NJID	Facility's Designation	Equipment Description	Equipment Type	Certificate Number	Install Date	Grand-Fathered	Last Mod. (Since 1968)	Equip. Set ID
E6102	R-6102	R-6102 Reactor System including R-6102, E-6102A, E-6102B, E-6102D, and WS-6102	Manufacturing and Materials Handling Equipment					
E6103	R-6102Feed	R-6102 Dry Material Feed System including BU-6102 and C-6102	Manufacturing and Materials Handling Equipment					
E6104	R-6105Feed	R-6105 Dry Material Feed System including BU-6105, C-6105, and H-6105	Manufacturing and Materials Handling Equipment					
E6105	R-6105	R-6105 Reactor System including R-6105, E-6105A, E-6105B, and E-6105C	Manufacturing and Materials Handling Equipment					
E6106	R-6101Drum	R-6101 Drum/tote container filling system	Manufacturing and Materials Handling Equipment					
E610100			Manufacturing and Materials Handling Equipment					

Troy Chemical Corp (05459) Date: 1/7/2025

New Jersey Department of Environmental Protection
Control Device Inventory

CD NJID	Facility's Designation	Description	CD Type	Install Date	Grand-Fathered	Last Mod. (Since 1968)	CD Set ID
CD6102	SC-6102	Scrubber for BU-6102/C-6102	Scrubber (Multi-Stage)				
CD6105	SC-6105	Scrubber for BU-6105/C-6105	Scrubber (Multi-Stage)				
CD610100			Adsorber				

Troy Chemical Corp (05459)

Date: 1/7/2025

New Jersey Department of Environmental Protection
Emission Points Inventory

PT NJID	Facility's Designation	Description	Config.	Equiv. Diam. (in.)	Height (ft.)	Dist. to Prop. Line (ft)	Exhaust Temp. (deg. F)			Exhaust Vol. (acfm)			Discharge Direction	PT Set ID
							Avg.	Min.	Max.	Avg.	Min.	Max.		
PT6102	R-6102 Stack	Discharge stack for R-6102/E-6102B	Round	3	30	50	100.0	60.0	120.0	200.0	150.0	300.0	Down	
PT6103	SC-6102Stack	Discharge stack for SC-6102 Scrubber	Round	8	25	50	70.0	60.0	100.0	1,000.0	1,000.0	1,000.0	Up	
PT6104	SC-6105Stack	Discharge stack for SC-6105 Scrubber	Round	6	23	50	70.0	60.0	100.0	250.0	150.0	500.0	Up	
PT6105	R-6105 Stack	Discharge stack for R-6105/E-6105B	Round	3	30	50	100.0	60.0	120.0	200.0	150.0	300.0	Down	
PT6106	6101DrumSys	Man door for R-6101 drum/tote system	Door	64	6	50	70.0	60.0	100.0	100.0	150.0	200.0	Horizontal	
PT6111	R-6101RD	Emergency stack for R-6101 Rupture Disk	Round	2	30	50	100.0	60.0	120.0	0.0	0.0	300.0	Up	
PT6112	R-6102RD	Emergency relief stack for R-6102 Rupture Disk	Round	2	30	50	100.0	60.0	120.0	0.0	0.0	300.0	Up	
PT6115	R-6105RD	Emergency relief stack for R-6105 Rupture Disk	Round	2	30	50	100.0	60.0	120.0	0.0	0.0	300.0		
PT610100			Round											
PT610101			Round											

Troy Chemical Corp (05459)

Date: 1/7/2025

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

U 610100

UOS NJID	Facility's Designation	UOS Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Annual Oper. Hours Min.	Annual Oper. Hours Max.	VOC Range	Flow (acfm) Min.	Flow (acfm) Max.	Temp. (deg F) Min.	Temp. (deg F) Max.
OS4	R-6101	R-6101 Reactor System Operation	Normal - Steady State	E610100	CD610100 (P)	PT610101	3-01-033-20	0.0	6,000.0	A	0.0	15.0	30.0	140.0
OS5	R-6102	R-6102 reactor System Operation	Normal - Steady State	E6102	CD6102 (P)	PT6103	3-01-033-20	0.0	6,000.0	A	150.0	500.0	60.0	160.0
OS6	R-6105	R-6105 Reactor System Operation	Normal - Steady State	E6105	CD6105 (P)	PT6104	3-01-033-20	0.0	6,000.0	A	150.0	500.0		160.0
OS14	R-6101DrumSy	R-6101 Drum/Tote System	Normal - Steady State	E6106		PT6106	3-01-033-41	0.0	6,000.0	A	100.0	200.0	60.0	120.0
OS15	R-6102Feed	R-6102 Dry Material Feed System Operation	Normal - Steady State	E6103	CD6102 (P)	PT6103	3-01-033-32	0.0	6,000.0	A	1,000.0	1,000.0	70.0	70.0
OS16	R-6105Feed	R-6105 Dry Material Feed System Operation	Normal - Steady State	E6104	CD6105 (P)	PT6104	3-01-033-32	0.0	6,000.0	A	150.0	500.0	60.0	120.0

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: U610100

Operating Scenario: OS0 Summary

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	tons/yr	No
PM-10 (Total)			D	D	tons/yr	No
TSP			D	D	tons/yr	No
VOC (Total)			0.04730000	0.04730000	tons/yr	No

Subject Item: U610100

Operating Scenario: OS4

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)		D	D	D	lb/hr	No
PM-10 (Total)		D	D	D	lb/hr	No
TSP		D	D	D	lb/hr	No
VOC (Total)		D	D	D	lb/hr	No

Subject Item: U610100

Operating Scenario: OS5

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)		D	D	D	lb/hr	No
VOC (Total)		0.07600000	0.07600000	0.07600000	lb/hr	No

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: **U610100**

Operating Scenario: **OS6**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)		D	D	D	lb/hr	No
VOC (Total)		0.06100000	0.06100000	0.06100000	lb/hr	No

Subject Item: **U610100**

Operating Scenario: **OS14**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	lb/hr	No
VOC (Total)		0.12200000	0.12200000	0.12200000	lb/hr	No

Subject Item: **U610100**

Operating Scenario: **OS15**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	lb/hr	No
PM-10 (Total)		D	D	D	lb/hr	No
TSP		D	D	D	lb/hr	No

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: U610100

Operating Scenario: OS16

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	lb/hr	No
PM-10 (Total)		D	D	D	lb/hr	No
TSP		D	D	D	lb/hr	No

000000 E6102 (Manufacturing and Materials Handling Equipment)
Print Date: 1/7/2025

Make:	De Dietrich
Manufacturer:	De Dietrich
Model:	SA1500
Type of Manufacturing and Materials Handling Equipment:	Reactor
Capacity:	1.50E+03
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6103 (Manufacturing and Materials Handling Equipment)
Print Date: 1/7/2025

Make:	Custom
Manufacturer:	Custom
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Bulk Bag Unloader and Conveyor
Capacity:	3.00E+03
Units:	other units
Description (if other):	pounds/hour
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6104 (Manufacturing and Materials Handling Equipment)
Print Date: 1/7/2025

Make:	Hapman
Manufacturer:	Hapman
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Bulk Bag Unloader and Conveyor
Capacity:	3.00E+03
Units:	other units
Description (if other):	pounds/hour
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6105 (Manufacturing and Materials Handling Equipment)
Print Date: 1/7/2025

Make:	Tolan
Manufacturer:	Tolan
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Reactor
Capacity:	5.50E+03
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6106 (Manufacturing and Materials Handling Equipment)
Print Date: 1/7/2025

Make:	Custom
Manufacturer:	Custom
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Drum/tote filling system with floor scale
Capacity:	5.00E+02
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 CD6102 (Scrubber (Multi-Stage))
Print Date: 1/7/2025

Make:	Mapco
Manufacturer:	Mapco
Model:	300
Number of Stages:	1
Is the Scrubber Used for Particulate Control?	(●) Yes ( ) No
Is the Scrubber Used for Gas Control?	(●) Yes ( ) No
Is the Scrubber Equipped with a Mist Eliminator?	(●) Yes ( ) No
Minimum Pump Discharge Pressure (in. H20):	
Maximum Pump Discharge Pressure (in. H20):	
Method of Monitoring Pump Discharge Pressure:	
Minimum Pump Current (amps):	
Maximum Pump Current (amps):	
Method of Monitoring Pump Current:	
Minimum Scrubber Medium Inlet Pressure (in. H20):	
Minimum Operating Liquid Flow Rate (gpm):	4.00
Maximum Operating Liquid Flow Rate (gpm):	12.00
Method of Monitoring Liquid Flow Rate:	Visual gauge
Minimum Operating Gas Flow Rate (acfm):	
Maximum Operating Gas Flow Rate (acfm):	
Method of Monitoring Gas Flow Rate:	
Minimum Operating Pressure Drop (in. H20):	0.25
Maximum Operating Pressure Drop (in. H20):	12.00
Method of Monitoring Pressure Drop:	Visual gauge
Relative Direction of the Gas-Liquid Flow:	
Description:	
Maximum Inlet Gas Temperature (°F):	
Maximum Outlet Gas Temperature (°F):	
Inlet Particle Grain Loading (gr/dscf):	
Maximum Number of Sources Using this Apparatus as a Control Device (Include Permitted and Non-Permitted Sources):	2
Alternative Method to Demonstrate Control Apparatus is Operating Properly:	
Have you attached data from recent performance testing?	( ) Yes (●) No
Have you attached any manufacturer's data or specifications in support of the feasibility and/or effectiveness of this control apparatus?	( ) Yes (●) No
Have you attached a diagram showing the location and/or configuration of this control apparatus?	( ) Yes (●) No

000000 CD6102 (Scrubber (Multi-Stage))
Print Date: 1/7/2025

Comments:

05459 Troy Chemical Corp PCP000000 U610100 OS4 (Gas Flow)
Print Date: 1/7/2025

Volume of Gas Discharged from this source (acfm):	15.00

05459 Troy Chemical Corp PCP000000 U610100 OS4 (Raw Materials)
Print Date: 1/7/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Powders		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

05459 Troy Chemical Corp PCP000000 U610100 OS4 (Efficiency Table - CD610100)
Print Date: 1/7/2025

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
CO			
HAP (Total)			
NOx			
Other (Total)			
Pb			
PM-10			
PM-2.5			
SO2			
TSP			
VOC (Total)	100.00	80.00	80.00

05459 Troy Chemical Corp PCP000000 U610100 OS5 (Raw Materials)
Print Date: 1/7/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Methyl alcohol (Methanol)	00067-56-1	Liquid	32.040	Yes				lb/gal
Non-HAP Particulate		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

05459 Troy Chemical Corp PCP000000 U610100 OS5 (Gas Flow)
Print Date: 1/7/2025

Volume of Gas Discharged from this source (acfm):	500.00

05459 Troy Chemical Corp PCP000000 U610100 OS5 (Scrubber Multi Stage - CD6102)
Print Date: 1/7/2025

Stage	Liquid Recirculation Method	Liquid Being Used for Adsorption	Chemical Additive in Scrubbing Medium	Minimum Concentration of Chemical Additive	Maximum Concentration of Chemical Additive	How is the Activity of the Scrubbing Medium Maintained?	Maximum pH
1							

	Min Ph	Max Oxi Re	Min Oxi Redu
	Minimum pH	**Maximum Oxidation Reduction Potential (mV)**	**Minimum Oxidation Reduction Potential (mV)**

05459 Troy Chemical Corp PCP000000 U610100 OS5 (Efficiency Table - CD6102)
Print Date: 1/7/2025

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
Other (Total)			
SO2			
HAP (Total)			
PM-10	100.00	99.00	99.00
VOC (Total)			
CO			
NOx			
Pb			
PM-2.5	100.00	99.00	99.00
TSP	100.00	99.00	99.00
Formaldehyde	100.00	99.99	99.99

05459 Troy Chemical Corp PCP000000 U610100 OS6 (Gas Flow)
Print Date: 1/7/2025

Volume of Gas Discharged from this source (acfm):	500.00

05459 Troy Chemical Corp PCP000000 U610100 OS6 (Raw Materials)
Print Date: 1/7/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Methyl alcohol (Methanol)	00067-56-1	Liquid	32.040	Yes				lb/gal
Non-HAP Particulate		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

05459 Troy Chemical Corp PCP000000 U610100 OS14 (Raw Materials)
Print Date: 1/7/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Powders		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

05459 Troy Chemical Corp PCP000000 U610100 OS14 (Gas Flow)
Print Date: 1/7/2025

Volume of Gas Discharged from this source (acfm):	15.00

05459 Troy Chemical Corp PCP000000 U610100 OS15 (Gas Flow)
Print Date: 1/7/2025

Volume of Gas Discharged from this source (acfm):	1,000.00

05459 Troy Chemical Corp PCP000000 U610100 OS15 (Raw Materials)
Print Date: 1/7/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Particulate		Solid		No				

05459 Troy Chemical Corp PCP000000 U610100 OS15 (Efficiency Table - CD6102)
Print Date: 1/7/2025

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
CO			
NOx			
Pb			
PM-2.5	100.00	99.00	99.00
TSP	100.00	99.00	99.00
Formaldehyde	100.00	99.99	99.99
HAP (Total)			
Other (Total)			
PM-10	100.00	99.00	99.00
SO2			
VOC (Total)			

05459 Troy Chemical Corp PCP000000 U610100 OS15 (Scrubber Multi Stage - CD6102)
Print Date: 1/7/2025

Stage	Liquid Recirculation Method	Liquid Being Used for Adsorption	Chemical Additive in Scrubbing Medium	Minimum Concentration of Chemical Additive	Maximum Concentration of Chemical Additive	How is the Activity of the Scrubbing Medium Maintained?	Maximum pH
1	Recirculated		NaOH	0.50	5.00	pH	14.0

	Min Ph	Max Oxi Re	Min Oxi Redu
	Minimum pH	**Maximum Oxidation Reduction Potential (mV)**	**Minimum Oxidation Reduction Potential (mV)**
	7.0		

05459 Troy Chemical Corp PCP000000 U610100 OS16 (Raw Materials)
Print Date: 1/7/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Particulate		Solid		No				

05459 Troy Chemical Corp PCP000000 U610100 OS16 (Gas Flow)
Print Date: 1/7/2025

Volume of Gas Discharged from this source (acfm):	500.00

Troy Chemical Corp (05459)

Date: 1/6/2025

New Jersey Department of Environmental Protection
Reason for Application

Permit Being Modified

Permit Class: PCP **Number:** 20001

Description of Modifications: Troy Chemical Corp is submitting this application to revise PCP020001 in order to streamline operations by combining multiple permits into one pre-construction permit covering all manufacturing operations occuring in Building 61 (per NJDEP's present requirements), update the permit to current nomenclature and align the permit more closely with current operations.
As part of this application to modify PCP020001, please update nomenclature within the permit to match current facility nomenclature as follows:
Change the emission unit number from "U610100" to "U6101"
Change the Emission Unit description from "R-6101 System" to "Building 61 Manufacturing Process"
Change the equipment number: "E610100" to "E6101",
Change the equipment description of E6101 from "Vessel R-6101 System: multi-purpose, glass lined jacketed vessel (includes condenser 1, T-6101A, vacuum steam jet, condenser 2, T-6101B, T-6101C)" to "R-6101 system including E-6101, E6101A, E-6101B, E-6101C, E-6101D, T-6101A, T-6101C, and glass receiver"
Renumber "PT610100" to "PT6101"
Remove Operating Scenarios OS1, OS2 and OS3 from the permit.
Additionally, please cancel the following permits: PCP170003, and PCP960039 as all equipment on these permits will now be part of this revised permit anticipated to be called PCP240002.
An air flow block diagram and calculations are attached for all operating scenarios. All HAP emissions remain below reporting thresholds and are listed on the raw materials list for each applicable operating scenario.
The facility anticipates that the application fee for this permit revision will be $5,490 consisting of the first source at $2,540 and five additional sources at $590 each.
If there are any questions regarding this application, please contact Troy's consultant Dean Koncsol of Baron Environmental Associates at (908) 508-9000 or dean.koncsol@baronenv.com.

Troy Chemical
Newark, NJ
PID: 05459

U6101 Building 61 Total Emissions (OS0)

Annual VOC Emissions (TPY)	
OS4 (R-6101 Operations)	D
OS5 (R-6102 Operations)	0.014
OS6 (R-6105 Operations)	0.011
OS15 (Dry material loading R-6102)	1.92E-05
OS16 (Dry material loading R-6105)	1.92E-05
OS14 (R-6101 Drumming System)	0.022
VOC Total TPY	**0.0473**

HAPS	
Ethylene glycol	**D**
Formaldehyde	**D**
Methanol	**D**
Particulate Matter (PM-10, PM-2.5, TSP)	**D**

Troy Chemical
Newark, NJ
PID: 05459

U6101 Buidling 61 - Particulate Emissions (OS4, OS15, OS16)

Data/Assumptions:

- Assume worst-case emissions occur from saturated air displacement during material transfer.
- AP-42 emission factor for crushed stone processing - screening selected to be conservative = 0.025 lbs/ton processed
- Raw materials processed by these pieces of equipment include paraformaldehyde and non-HAP particulates
- The chemical formlua for formaldehyde is CHCO

Hourly and Annual Emission Calculations (for OS15-16 - Dry feed systems for R-6102 and R-6105):

Paraformaldehyde is the worst case producer of particulate. Max usage is 24,000 pounds, loaded at 3,000 pounds/hour. To be conservative, 3,500 pounds/hour used.

TSP Calculations:

lbs/ hr = lbs/ hour * 1 ton/ 2,000 lbs * emission factor [lbs/ton processed]
lbs/hr =3,500 lbs/hr * 1 ton/ 2,000 lbs * 0.025 lbs/ton processed
lbs/hr = 0.04375 **De minimis**

Hourly and Annual Emission Calculations (for OS15-16 - Dry feed systems for R-6102 and R-6105):

DIDM is the worst case producer of particulate. Max usage is 24,000 pounds, loaded at 3,000 pounds/hour. To be conservative, 3,500 pounds/hour used.

TSP Calculations:

lbs/ hr = lbs/ hour * 1 ton/ 2,000 lbs * emission factor [lbs/ton processed]
lbs/hr =3,500 lbs/hr * 1 ton/ 2,000 lbs * 0.025 lbs/ton processed
lbs/hr = 0.04375 **De minimis**

Hourly and Annual Formaldehyde Emission Calculations (for OS15-16 - Dry feed systems for R-6102 and R-6105):

- Paraformaldehyde contains up to 1% formaldehyde
- Scrubbers have DRE of 99%

Formaldehyde emissions before control:
CHCO lb/hr = Paraformaldehyde lb/hr * % of formaldehyde in paraformaldehyde
CHCO lb/hr = 0.04375 lb/hr * 1% formaldehyde in material
CHCO lb/hr = 0.00044

Formaldehyde emissions after control:
CHCO lb/hr = CHCO lb/hr * (1 - DRE of scrubber)
CHCO lb/hr = 0.00044 lb/hr * (1 - 0.99)
CHCO lb/hr AC = 0.0000044

Annual CHCO lbs = CHCO lb/hr AC * 8,760 hours/year
Annual CHCO lbs = 0.0000044 lbs/hr * 8,760 hours/year
Annual CHCO lbs = 0.038 < 3.5# reporting threshold, de minimis

Hourly and Annual Formaldehyde Emission Calculations (for OS14 - Loading of R-6101):

- Paraformaldehyde contains up to 1% formaldehyde
- Maximum addition of paraformaldehyde 495 pounds

TSP Calculations:

lbs/ hr = lbs/ hour * 1 ton/ 2,000 lbs * emission factor [lbs/ton processed]
lbs/hr =495 lbs/hr * 1 ton/ 2,000 lbs * 0.025 lbs/ton processed
lbs/hr = 0.00619 **de miniims**

Formaldehyde emissions:
CHCO lb/hr = CHCO lb/hr * (1 - DRE of scrubber)
CHCO lb/hr = 0.00619 lb/hr * (1 - 0.99)
CHCO lb/hr = 0.00006

Annual CHCO lbs = CHCO lb/hr AC * 8,760 hours/year
Annual CHCO lbs = 0.00006 lbs/hr * 8,760 hours/year
Annual CHCO lbs = 0.542 < 3.5# reporting threshold, de minimis

Troy Chemical
Newark, NJ
PID: 05459

U6101 OS4 Hourly and Annual VOC/HAP Calculations:

Data/Assumptions:
- Assume worst-case VOC emissions for vessel occur during filling.
- Assume worst-case hourly emission rate from saturated air displacement during filling.
- Molecular weight of isodecanol is 158.3
- Vapor pressure of isodecanol is 0.81 mmHg at 70F
- Density of isodecanol is 7.01 lbs/gallom
- Maximum quantity of isodecanol used is 9,236 lbs/batch
- All liquid ingredients are placed into an empty vessel; paraformaldehyde is added last
- All other similar information is shown in the tables below.
- R-6101 is a 1,500 gallon reactor.
- Maximum number of batches to be manufactured = 365 per year
- R-6101 is connected to activated carbon adsorber. As a safety factor, assume control to be 80% (in actuality control is hig

Potential Emissions

Hourly Emission Calculations (Part 1 - worst case VOC emisisons):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (9236 lbs * 1 gallon / 7.01 lbs) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 176.119 Cu. Ft./batch

Isodecanol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Isodecanol lb/batch = (176.12 Cu. Ft./batch) * (0.81 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (158.3 lb/lb-mol])
Isodecanol lb/batch = 0.077 lb/batch **<<<-- Worst Case VOC emissions per batch**
Isodecanol after control lb/batch = 0.015 lb/batch **De Minimis**

Hourly Emission Calculations (Formlua K14 - worst case HAP emisisons):

Mole Fraction and Partial Pressure Calculations for initial liquid fill:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	8.53%	62.07	0.137	2.6%	0.414	0.01090
DI water	91.42%	18	5.079	97.3%		0.000
Caustic solution	0.06%	39.997	0.001	0.0%		0.000
				0.0%		0.000
	100%		5.218	100.0%		

Hourly Emission Calculations (Formlua K14 - worst case HAP emisisons):

Mole Fraction and Partial Pressure Calculations for paraformaldehyde addition:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	7.81%	62.07	0.126	2.5%	0.414	0.01029
Paraformaldehyde	8.35%	30.026	0.278	5.5%	0	0.000
Formaldehyde	0.08%	30	0.003	0.1%	26	0.014
DI water	83.71%	18	4.650	91.9%		0.000
Caustic solution	0.05%	39.997	0.001	0.0%		0.000
				0.0%		0.000
	100%		5.058	100.0%		

Hourly Emission Calculations (Formula K14):

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (1500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 200.508 Cu. Ft./batch <- for liquid materials

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (458+4911+3)* (1 gallon / 8.33 pounds)
Volume used = 644.898 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (1500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 114.3032 Cu. Ft./batch <- for paraformaldehyde

Ethylene glycol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
EG lb/batch = (200.508 Cu. Ft./batch) * (0.00103 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (62.07 lb/lb-mol])
EG lb/batch = 0.00046 lb/batch

Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (200.508 Cu. Ft./batch) * (0.014mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.0002 lb/batch

VOC lb/bbatch = EG VOC lb/batch + Formaldehyde VOC lb/batch
VOC lb/batch = 0.00044 lb/batch + 0.0002 lb/batch
VOC lb/batch = 0.001

Annual HAP Emissions per vessel:

Formaldehyde lbs/yr = (Formaldehyde lb/batch * batches/year)
Formaldehyde lbs/yr = (0.0002 lb/batch * 365 batches/year)
Formaldehyde lbs/yr = 0.000 lbs/yr **D** Reporting Threshold for Formaldehyde = 3.5 lbs/yr

EG lbs/yr = (EG lb/batch * batches/year)
EG lbs/yr = (0.00044 lb/batch * 365 batches/year)
EG lbs/yr = 0.000 lbs/yr **D** Reporting Threshold for EG = 2,000 lbs/yr

Subchapter 16.16 Compliance

lb/hr VOC = 0.015
Air Flow = 15 SCFM (from PT inventory)
Mol. Weight = 400

ppmVOC = ((0.015 lb / hr) * (387) * (10^6)) / ((400 mol / lbmol) * (60 min) * (250 SCFM (vent flow SCFM)))
ppmVOC = 82.53840881

82.538 ppm VOC is **Range A**
Range A lbs/VOC per hour must be less than 3.5. This source satisfies Sub-16 requirements.

Troy Chemical
Newark, NJ
PID: 05459

U6101 OS5 Hourly and Annual VOC/HAP Calculations:

Data/Assumptions:

- Assume worst-case VOC emissions for Tank occur during Loading.
- Assume worst-case hourly emission rate from saturated air displacement during Loading.
- R-6102 is a 5,500 gallon reactor
- Maxmum of 365 batches manufactured per year
- There are three calculation sets identifying worst case emissions for various HAPs and for VOC depending upon the formulation. There is also a calculation for the reaction stage of the process. Annual emissions are based upon the assumption that the vessel could run the only the batch that yields the worst case for each contaminant (instead of various formulations as would be the case) as an added safety factor.
- All liquid ingredients are placed into an empty vessel; paraformaldehyde is added last
- R-6102 reactor exhausts into SC - 6105/02, efficiency of scrubber is 0.9999, documentation provided.

Worst Case Emissions R-6102 (OS5) for VOC and Formaldehyde

Potential Emissions

Manufacture of Formula 192

Mole Fraction and Partial Pressure Calculations for addition of paraformaldehyde:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
AMP 95	71.44%	89.14	0.801	45.7%	0.34	0.15545
Paraformaldehyde	28.28%	30.026	0.942	53.7%	0	0.000
Formaldehyde	0.29%	30	0.010	0.5%	26	0.141
				0.0%		0.000
	100%		1.753	100.0%		

Hourly Emission Calculations (Formula 192):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 735.1958 Cu. Ft./batch <-- for AMP 95

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (28574)* (1 gallon / 8.33 pounds)
Volume used = 3430.252 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 276.6673 Cu. Ft./batch

AMP 95 lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
AMP 95 lb/batch = (735.196 Cu. Ft./batch) * (0.34 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (89.14 lb/lb-mol])
AMP 95 lb/batch = 0.0758 lb/batch

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (276.667 Cu. Ft./batch) * (0.141 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.0040 lb/batch

Formaldehyde After Control
Formaldehyde lb/batch = Before Control Formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = 0.0040 lb/batch * (1-0.9999)
Formaldehyde lb/batch = 0.0000 lb/batch

VOC lb/bbatch = AMP VOC lb/batch + Formaldehyde VOC lb/batch
VOC lb/batch = 0.0758 lb/batch + 0.0000 lb/batch
VOC lb/batch = 0.076 <<-- Worst case VOC emissions

Worst Case Emissions R-6102 (OS5) for Methanol & Formaldehyde

Emissions from loading vessel:

Manufacture of Formula 95

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.71%	32.04	0.022	0.7%	97.658	0.69620
Tris amino	51.81%	121.14	0.428	13.9%		0.000
DI water	47.48%	18	2.638	85.4%		0.000
	100%		3.088	100.0%		

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.51%	32.04	0.016	0.5%	97.658	0.49350
Paraformaldehyde	27.30%	30.026	0.909	28.8%	0	0.000
Formaldehyde	0.28%	30	0.009	0.3%	26	0.076
Tris amino	37.53%	121.14	0.310	9.8%		0.000
DI water	34.39%	18	1.910	60.6%		0.000
	100%		3.155	100.0%		

Hourly Emission Calculations (Formula 95):

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 735.1958 Cu. Ft./batch

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (34740)* (1 gallon / 8.33 pounds)
Volume used = 4170.468 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 177.7211 Cu. Ft./batch

Methanol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Methanol lb/batch = (735.196 Cu. Ft./batch) * (0.494 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (32.04 lb/lb-mol])
Methanol lb/batch before control = 0.0558 lb/batch
Methanol lb/batch after control = 0.0000 lb/batch

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (177.72 Cu. Ft./batch) * (0.076 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.00137 lb/batch

Formaldehyde After Control
Formaldehyde lb/batch = Before Control Formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = 0.00137 lb/batch * (1-0.9999)
Formaldehyde lb/batch = 0.0000 lb/batch

Emissions from Reaction Stage

Reactions occur at 158F
Tank is 90% full, therefore displaced air is 10% of the volume of the vessel

Manufacture of Formula 95

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure @ 158F (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.71%	32.04	0.022	0.7%	97.658	0.69620
Tris amino	51.81%	121.14	0.428	13.9%		0.000
DI water	47.48%	18	2.638	85.4%		0.000
	100%		3.088	100.0%		

Mole Fraction and Partial Pressure Calculations:				

Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure @ 158F (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.51%	32.04	0.016	0.5%	982.58	4.96536
Paraformaldehyde	27.30%	30.026	0.909	28.8%	0	0.000
Formaldehyde	0.28%	30	0.009	0.3%	12751	37.156
Tris amino	37.53%	121.14	0.310	9.8%		0.000
DI water	34.39%	18	1.910	60.6%		0.000
	100%		3.155	100.0%		

Hourly Emission Calculations (Formula 95):

Displacement Air Flow (Cu. Ft./batch) = (max volume) * 10% headspace * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * 0.1 * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 73.51958 Cu. Ft./batch

Methanol Before Control
Methanol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Methanol lb/batch = (735.196 Cu. Ft./batch) * (0.494 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (32.04 lb/lb-mol])
Methanol lb/batch = 0.0056 lb/batch
Methanol lb/batch after control = 0.0000

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (177.72 Cu. Ft./batch) * (0.076 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.27863 lb/batch **<<-- Worst case Formaldehyde lb/batch**

Total Formaldehyde After Control
Formaldehyde lb/batch = Before Control formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = (0.00137 lb/batch loading + 0.279 lb/batch reaction) * (1-0.9999)
Formaldehyde lb/batch = 0.0000

Total VOC lb/batch = Methanol (Loading + Reaction) VOC lb/batch + Formaldehyde (Loading + Reaction) VOC lb/batch
VOC lb/batch = 0.0000 lb/batch + 0.0000 lb/batch
VOC lb/batch = 0.00003

Worst Case Emissions R-6102 (OS5) for Ethylene Glycol

Manufacture of Formula K14

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	3.89%	62.07	0.063	1.2%	0.414	0.00505
DI water	90.81%	18	5.045	98.2%		0.000
Caustic solution	0.03%	39.997	0.001	0.0%		0.000
Hydrochloric acid	0.07%	36.46	0.002	0.0%		0.000
Copper nitrate	5.21%	187.46	0.028	0.5%		0.000
				0.0%		0.000
	100%		5.138	100.0%		

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	3.73%	62.07	0.060	1.2%	0.414	0.00492
Paraformaldehyde	3.99%	30.026	0.133	2.6%	0	0.000
Formaldehyde	0.04%	30	0.001	0.0%	26	0.007
DI water	87.14%	18	4.841	95.6%		0.000
Caustic solution	0.03%	39.997	0.001	0.0%		0.000
Hydrochloric acid	0.06%	36.46	0.002	0.0%		0.000
Copper nitrate	5.00%	187.46	0.027	0.5%		0.000
				0.0%		0.000
	100%		5.065	100.0%		

Hourly Emission Calculations (Formula K14):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 735.1958 Cu. Ft./batch

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (38386)* (1 gallon / 8.33 pounds)
Volume used = 4608.163 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 119.2136 Cu. Ft./batch <- for paraformaldehyde

Ethylene glycol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
EG lb/batch = (735.196 Cu. Ft./batch) * (0.00492 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (62.07 lb/lb-mol])
EG lb/batch = 0.000783 lb/batch 0.286 lb/yr

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (119.21 Cu. Ft./batch) * (0.007 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.000084 lb/batch

Formaldehyde After Control
Formaldehyde lb/batch = Before Control formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = 0.000084 lb/batch * (1-0.9999)
Formaldehyde lb/batch = 0.0000

VOC lb/bbatch = Ethylene glycol VOC lb/batch + Formaldehyde VOC lb/batch
VOC lb/batch = 0.000763 lb/batch + 0.000517 lb/batch
VOC lb/batch = 0.001

Annual HAP Emissions R-6102:

Formaldehyde lbs/yr = (Formaldehyde (Vessel Loading) lb/batch + Formaldehyde (Reaction) lb/batch) * batches/year
Formaldehyde lbs/yr = (0.0000 lb/batch + 0.0000 lb/batch) * 365 batches/year
Formaldehyde lbs/yr = 0.01 lbs/yr **D** Reporting Threshold for Formaldehyde = 3.5 lbs/yr

Methanol lbs/yr = (Methanol (Vessel Loading) lb/batch + Methanol (Reaction) lb/batch) * batches/year
Methanol lbs/yr = (0.0000 lbs/batch + 0.0000 lbs/batch) * 365 batches/year
Methanol lbs/yr = 0.00 **D** Reporting Threshold for Methanol = 2,000 lbs/yr

Ethylene glycol lba/yr = EG lb/batch * batches/year
EG lb/yr = 0.000763 lb/batch * 365 batches/year
EG lb/yr = 0.29 **D** Reporting Threshold for Ethylene glycol = 2,000 lbs/yr

Annual VOC Emissions R-6102:
VOC lbs/yr = Max VOC lb/batch * batches/yr
VOC lbs/yr = 0.076 lb/batch * 365 batches/year
VOC lbs/yr = 27.652
VOC TPY = 0.014

Subchapter 16.16 Compliance
lb/hr VOC = 0.076
Air Flow = 50 SCFM (from PT inventory)
Mol. Weight = 30

ppmVOC = ((0.096 lb / hr) * (387) * (10^6)) / ((400 mol / lbmol) * (60 min) * (50 SCFM (vent flow SCFM)))
ppmVOC = 24.43

30.2 ppmVOC is **Range A**
Range A lbs/VOC per hour must be less than 3.5. These sources satisfy Sub-16 requirements.

Troy Chemical
Newark, NJ
PID: 05459

U6101 OS6 Hourly and Annual VOC/HAP Calculations:

Data/Assumptions:

- Assume worst-case VOC emissions for Tank occur during Loading.
- Assume worst-case hourly emission rate from saturated air displacement during Loading.
- R-6105 is a 5,500 gallon reactor
- Maxmum of 365 batches manufactured per year
- There are three calculation sets identifying worst case emissions for various HAPs and for VOC depending upon the formulation. There is also a calculation for the reaction stage of the process. Annual emissions are based upon the assumption that the vessel could run the only the batch that yields the worst case for each contaminant (instead of various formulations as would be the case) as an added safety factor.
- All liquid ingredients are placed into an empty vessel; paraformaldehyde is added last
- R-6105 reactor exhausts into SC - 6105/02, efficiency of scrubber is 0.9999, documentation provided.

Worst Case Emissions R-6105 (OS6) for VOC and Formaldehyde

Potential Emissions

Manufacture of Formula 174

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Monoethanolamine	65.28%	61.08	1.069	48.0%	0.4	0.19212
Paraformaldehyde	34.37%	30.026	1.145	51.4%	0	0.000
Formaldehyde	0.35%	30	0.012	0.5%	26	0.135
				0.0%		0.000
	100%		2.225	100.0%		

Hourly Emission Calculations (Formula 174):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 735.1958 Cu. Ft./batch

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (33842)* (1 gallon / 8.33 pounds)
Volume used = 4062.665 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 192.1314 Cu. Ft./batch <- for paraformaldehyde

Monoethanolamine lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
MEA lb/batch = (735.196 Cu. Ft./batch) * (0.4 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (61.08 lb/lb-mol])
MEA lb/batch = 0.0611 lb/batch

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (192.13 Cu. Ft./batch) * (0.135 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.0027 lb/batch

Formaldehyde After Control
Formaldehyde lb/batch = Before Control Formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = 0.0027 lb/batch * (1-0.9999)
Formaldehyde lb/batch = 0.0000 lb/batch

VOC lb/bbatch = MEAVOC lb/batch+ Formaldehyde VOC lb/batch
VOC lb/batch = 0.0611 lb/batch + 0.0000 lb/batch
VOC lb/batch = 0.061 <<-- Worst case formula for VOC emissions

Worst Case Emissions R-6105 (OS6) for Methanol

Manufacture of Formula 95

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.71%	32.04	0.022	0.7%	97.658	0.69620
Tris amino	51.81%	121.14	0.428	13.9%		0.000
DI water	47.48%	18	2.638	85.4%		0.000
	100%		3.088	100.0%		

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.51%	32.04	0.016	0.5%	97.658	0.49350
Paraformaldehyde	27.30%	30.026	0.909	28.8%	0	0.000
Formaldehyde	0.28%	30	0.009	0.3%	26	0.076
Tris amino	37.53%	121.14	0.310	9.8%		0.000
DI water	34.39%	18	1.910	60.6%		0.000
	100%		3.155	100.0%		

Emissions from Loading Stage

Hourly Emission Calculations (Formula 95):

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 735.1958 Cu. Ft./batch

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (34740)* (1 gallon / 8.33 pounds)
Volume used = 4170.468 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 177.7211 Cu. Ft./batch <- for paraformaldehyde

Methanol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Methanol lb/batch = (735.196 Cu. Ft./batch) * (0.696 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (32.04 lb/lb-mol])
Methanol lb/batch = 0.0558 lb/batch
Methanol lb/batch after control = 0.0000 lb/batch

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (177.72 Cu. Ft./batch) * (0.076 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.00137 lb/batch

Formaldehyde After Control
Formaldehyde lb/batch = Before Control Formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = 0.00137 lb/batch * (1-0.9999)
Formaldehyde lb/batch = 0.0000 lb/batch

VOC lb/bbatch = Methanol VOC lb/batch + Formaldehyde VOC lb/batch
VOC lb/batch = 0.0000 lb/batch + 0.0000 lb/batch
VOC lb/batch = 0.000

Emissions from Reaction Stage

Reactions occur at 158F
Tank is 90% full, therefore displaced air is 10% of the volume of the vessel

Manufacture of Formula 95

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure @ 158F (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.71%	32.04	0.022	0.7%	97.658	0.69620
Tris amino	51.81%	121.14	0.428	13.9%		0.000
DI water	47.48%	18	2.638	85.4%		0.000
	100%		3.088	100.0%		

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure @ 158F (mmHg)	Partial Press. Pi(mmHg)
Methanol	0.51%	32.04	0.016	0.5%	982.58	4.96536
Paraformaldehyde	27.30%	30.026	0.909	28.8%	0	0.000
Formaldehyde	0.28%	30	0.009	0.3%	12751	37.156
Tris amino	37.53%	121.14	0.310	9.8%		0.000
DI water	34.39%	18	1.910	60.6%		0.000
	100%		3.155	100.0%		

Hourly Emission Calculations (Formula 95):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * 10% headspace * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * 0.1 * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 73.51958 Cu. Ft./batch

Methanol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Methanol lb/batch = (735.196 Cu. Ft./batch) * (0.494 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (32.04 lb/lb-mol])
Methanol lb/batch = 0.0056 lb/batch
Methanol lb/batch after control = 0.0000 lb/batch

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (177.72 Cu. Ft./batch) * (0.076 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.27863 lb/batch **<<-- Worst case formula for formaldehyde emissions**
Formaldehyde lb/batch after control = 0.0000 lb/batch

Total Formaldehyde After Control
Formaldehyde lb/batch = Before Control formaldehyde lb/batch * (1 - 9999% DRE)
Formaldehyde lb/batch = (0.0027 lb/batch loading + 0.27863lb/batch reaction) * (1-0.9999)
Formaldehyde lb/batch = 0.0000

Total VOC lb/batch = Methanol (Loading + Reaction) VOC lb/batch + Formaldehyde (Loading + Reaction) VOC lb/batch
VOC lb/batch = 0.0000 lb/batch + 0.0000 lb/batch
VOC lb/batch = 0.00000

Worst Case Emissions R-6105 (OS6) for Ethylene Glycol

Manufacture of Formula K14

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	3.89%	62.07	0.063	1.2%	0.414	0.00505
DI water	90.81%	18	5.045	98.2%		0.000
Caustic solution	0.03%	39.997	0.001	0.0%		0.000
Hydrochloric acid	0.07%	36.46	0.002	0.0%		0.000
Copper nitrate	5.21%	187.46	0.028	0.5%		0.000
				0.0%		0.000
	100%		5.138	100.0%		

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	3.73%	62.07	0.060	1.2%	0.414	0.00492
Paraformaldehyde	3.99%	30.026	0.133	2.6%	0	0.000
Formaldehyde	0.04%	30	0.001	0.0%	26	0.007
DI water	87.14%	18	4.841	95.6%		0.000
Caustic solution	0.03%	39.997	0.001	0.0%		0.000
Hydrochloric acid	0.06%	36.46	0.002	0.0%		0.000
Copper nitrate	5.00%	187.46	0.027	0.5%		0.000
				0.0%		0.000
	100%		5.065	100.0%		

Hourly Emission Calculations (Formula K14):

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 735.1958 Cu. Ft./batch

Tank Volume Taken Up by Liquids
Volume used = Sum of pounds materials added * (1 gallon / 8.33 pounds)
Volume used = (38386)* (1 gallon / 8.33 pounds)
Volume used = 4608.163 gallons

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (5500 gal - gal in tank) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 119.2136 Cu. Ft./batch <- for paraformaldehyde

Ethylene glycol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
EG lb/batch = (735.196 Cu. Ft./batch) * (0.00492 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (62.07 lb/lb-mol])
EG lb/batch = 0.000783 lb/batch

Formaldehyde Before Control
Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (119.21 Cu. Ft./batch) * (0.007 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.000084 lb/batch
Formaldehyde lb/batch after control = 0.0000 lb/batch

VOC lb/bbatch = Ethylene glycol VOC lb/batch + Formaldehyde VOC lb/batch
VOC lb/batch = 0.000763 lb/batch + 0.0000 lb/batch
VOC lb/batch = 0.001

Annual HAP Emissions R-6105:

Formaldehyde lbs/yr = Formaldehyde (Loading + Reaction) lb/batch * batches/year
Formaldehyde lbs/yr = 0.0000 lb/batch * 365 batches/year
Formaldehyde lbs/yr = 0.01 lbs/yr **D** Reporting Threshold for Formaldehyde = 3.5 lbs/yr

Methanol lbs/yr = Methanol (Loading + Reaction) lb/batch * batches/year
Methanol lbs/yr = 0.0000 lbs/batch * 365 batches/year
Methanol lbs/yr = 0.00 **D** Reporting Threshold for Methanol = 2,000 lbs/yr

Ethylene glycol lba/yr = EG lb/batch * batches/year
EG lb/yr = 0.000763 lb/batch * 365 batches/year
EG lb/yr = 0.29 **D** Reporting Threshold for Ethylene glycol = 2,000 lbs/yr

Annual VOC Emissions R-6102:
VOC lbs/yr = Max VOC lb/batch * batches/yr
VOC lbs/yr = 0.061 lb/batch * 365 batches/year
VOC lbs/yr = 22.291
VOC TPY = 0.011

Subchapter 16.16 Compliance
lb/hr VOC = 0.061
Air Flow = 50 SCFM (from PT inventory)
Mol. Weight = 400

ppmVOC = ((0.061 lb / hr) * (387) * (10^6)) / ((400 mol / lbmol) * (60 min) * (50 SCFM (vent flow SCFM)))
ppmVOC = 19.70

27.7 ppmVOC is **Range A**
Range A lbs/VOC per hour must be less than 3.5. These sources satisfy Sub-16 requirements.

Troy Chemical
Newark, NJ
PID: 05459

U6101 OS14 Hourly and Annual VOC/HAP Calculations:

Data/Assumptions:
- Assume worst-case VOC emissions for vessel occur during filling.
- Assume worst-case hourly emission rate from saturated air displacement during filling.
- Assume hourly emisisons equal batch emissions to be conservative
- Maximum number of batches per year = 365
- Maximum temperature of drumming system = 195F

Potential Emissions

OS14 R-6101 Drumming System Worst-Case VOC Emissions

Drumming of DIDM occurs at 195F

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
DIDM	94.35%	396.00	0.238	87.2%		0.00000
Isodecanol	4.52%	158.3	0.029	10.5%	8.2	0.857
p toluene sulfonic	1.13%	172.2	0.007	2.4%		0.000
				0.0%		0.000
	100%		0.273	100.0%		

Hourly Emission Calculations (DIDM Drumming):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (1980 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 264.7 Cu. Ft./batch

DIDM lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
DIDM lb/batch = (264.7 Cu. Ft./batch) * (0.00000 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (396 lb/lb-mol])
DIDM lb/batch = 0.000 lb/batch

Isodecanol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Isodecanol lb/batch = (264.7 Cu. Ft./batch) * (0.857 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (158.3 lb/lb-mol])
Isodecanol lb/batch = 0.122 lb/batch

VOC lb/batch = DIDM VOC lb/batch
VOC lb/batch = 0.122 lb/batch
VOC lb/batch = 0.122 lbs VOC <<<--- Maximum VOC/batch

VOC lb/year = VOC lb/batch * 365 batches/year
VOC lb/year = 0.122 lb/batch * 365 batches/year
VOC lb/year = 44.56
VOC TPY = 0.022

OS14 R-6101 Drumming System Worst-Case HAP Emisisons

Drumming of Formula K14

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Ethylene glycol	7.81%	62.07	0.126	2.5%	0.414	0.01029
Paraformaldehyde	8.35%	30.026	0.278	5.5%	0	0.000
Formaldehyde	0.08%	30	0.003	0.1%	26	0.014
DI water	83.71%	18	4.650	91.9%		0.000
Caustic solution	0.05%	39.997	0.001	0.0%		0.000
				0.0%		0.000
	100%		5.058	100.0%		

Hourly Emission Calculations (Mergal K14):

Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (1500 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 200.508 Cu. Ft./batch

Note: The displacement volume calculation is a worst-case since batch sizes are less than the tank volume.

Ethylene glycol lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
EG lb/batch = (200.508 Cu. Ft./batch) * (0.00103 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (62.07 lb/lb-mol])
EG lb/batch = 0.00044 lb/batch

Formaldehyde lb/batch = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Formaldehyde lb/batch = (200.508 Cu. Ft./batch) * (0.014mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (30 lb/lb-mol])
Formaldehyde lb/batch = 0.0003 lb/batch

VOC lb/bbatch = EG VOC lb/batch + Formaldehyde VOC lb/batch
VOC lb/batch = 0.00044 lb/batch + 0.0003 lb/batch
VOC lb/batch = 0.001

Annual VOC Emissions R-6101 Drumming System:

VOC lbs/yr = Worst Case VOC lb/batch * batches/yr
VOC lbs/yr = 0.122 lbs/batch * 365 batches/yr
VOC lbs/yr = 44.56
VOC TPY = 0.0223

Annual HAP Emissions R-6101 Drumming System:

Formaldehyde lbs/yr = (Formaldehyde lb/batch * batches/year) + Particulate Emissions
Formaldehyde lbs/yr = (0.0003 lb/batch * 365 batches/year) + 0.542 lb/yr
Formaldehyde lbs/yr = 0.650 lbs/yr **D** Reporting Threshold for Formaldehyde = 3.5 lbs/yr

Ethylene glycol lb/yr = (EG lb/batch * batches/year)
EG lb/yr = (0.00044 lb/batch * 365 batches/yr)
EG lb/yr = 0.16 **D** Reporting Threshold for Ethylene glycol = 2,000 lb/yr

Subchapter 16.16 Compliance
lb/hr VOC = 0.122
Air Flow = 50 SCFM (from PT inventory)
Mol. Weight = 400

ppmVOC = ((0.122 lb / hr) * (387) * (10^6)) / ((400 mol / lbmol) * (60 min) * (50 SCFM (vent flow SCFM)))
ppmVOC = 39.37

39.4 ppmVOC is **Range A**
Range A lbs/VOC per hour must be less than 3.5. These sources satisfy Sub-16 requirements.

Troy Chemical
Newark, NJ
PID: 05459

U6101 OS15-OS16 Hourly and Annual VOC/HAP Calculations:

Data/Assumptions:
- Assume worst-case VOC emissions for vessel occur during filling.
- Assume worst-case hourly emission rate from saturated air displacement during filling.
- Assume hourly emisisons equal batch emissions to be conservative
- Maximum number of hours per year = 6,000
- Assume maximum filling capacity = 1,980 gallons/hour

Potential Emissions

OS15-16 R-6102 & R-6105 Drumming System Worst-Case VOC Emissions

Mole Fraction and Partial Pressure Calculations:						
Constituent	%Wt	Mol. Wt. (lb/lb-mol)	lb mol per 100-lb	Mol Fraction	V.P. pure (mmHg)	Partial Press. Pi(mmHg)
Other	85.00%	400.00	0.213	46.4%		0.00000
Ethanolamine	15.00%	61.08	0.246	53.6%	0.4	0.214
				0.0%		0.000
	100%		0.458	100.0%		

Hourly Emission Calculations (DIDM Drumming):
Displacement Air Flow (Cu. Ft./batch) = (max volume) * (1 cu. ft. / 7.481 gal) * (530/(460+temp))
Displacement Air Flow (Cu. Ft./batch) = (1980 gal) * (1 cu. ft. / 7.481 gal) * (530/530)
Displacement Air Flow (Cu. Ft./batch) = 264.7 Cu. Ft./batch

Ethanolamine lb/hour = (Air Flow [Cu. Ft./batch]) * (% Solvent in Air) * (lb-mol / 387 scf) * (Mol. Wt. [lb/lb-mol])
Ethanolamine lb/hour = (264.7 Cu. Ft./batch) * (0.214 mm Hg / 760 mm Hg) * (lb-mol / 387 scf) * (61.08 lb/lb-mol])
Ethanolamine lb/hour = 0.012 lb/batch

VOC lb/hour = Ethanolamine VOC lb/batch
VOC lb/hour = 0.012 lb/hour
VOC lb/hour = 0.012 lbs VOC <<<--- Maximum VOC/batch
D for VOC

New Jersey Department of Environmental Protection
Facility Profile (General)

Facility Name (AIMS): Troy Chemical Corp **Facility ID (AIMS):** 05459

Street Address: ONE AVE L
NEWARK, NJ 07105

Mailing Address: ONE AVE L
NEWARK, NJ 07105

State Plane Coordinates:
X-Coordinate:
Y-Coordinate:
Units:
Datum:
Source Org.:
Source Type:

County: Essex
Location Description:

Industry:
Primary SIC:
Secondary SIC:
NAICS: 325510

New Jersey Department of Environmental Protection
Facility Profile (General)

Contact Type: Air Permit Information Contact

Organization: Troy Chemical Corp
Org. Type: Private
Name: Harry Chen
NJ EIN: 22230683000
Title: EH&S Specialist
Phone: (973) 589-2500 x
Mailing Address: One Avenue L
Newark, NJ 07105
Fax: ( ) - x
Other: ( ) - x
Type:
Email: chenh@arxada.com

Contact Type: Fees/Billing Contact

Organization: Troy Chemical Corp
Org. Type: Private
Name: Harry Chen
NJ EIN: 22230683000
Title: EH&S Specialist
Phone: (973) 589-2500 x
Mailing Address: One Avenue L
Newark, NJ 07105
Fax: ( ) - x
Other: ( ) - x
Type:
Email: chenh@arxada.com

Contact Type: Responsible Official

Organization: Troy Chemical Corp
Org. Type: Private
Name: Agib Pierre Louis
NJ EIN: 22230683000
Title: Site Director
Phone: (973) 589-2500 x
Mailing Address: One Avenue L
Newark, NJ 07105
Fax: ( ) - x
Other: ( ) - x
Type:
Email: agib.pierrelouis@arxada.com

New Jersey Department of Environmental Protection
Facility Profile (Permitting)

1. Is this facility classified as a small business by the USEPA?	No
2. Is this facility subject to N.J.A.C. 7:27-22?	No
3. Are you voluntarily subjecting this facility to the requirements of Subchapter 22?	No
4. Has a copy of this application been sent to the USEPA?	No
5. If not, has the EPA waived the requirement?	No
6. Are you claiming any portion of this application to be confidential?	No
7. Is the facility an existing major facility?	No
8. Have you submitted a netting analysis?	No
9. Are emissions of any pollutant above the SOTA threshold?	No
10. Have you submitted a SOTA analysis?	No
11. If you answered "Yes" to Question 9 and "No" to Question 10, explain why a SOTA analysis was not required	
12. Have you provided, or are you planning to provide air contaminant modeling?	No

New Jersey Department of Environmental Protection
Equipment Inventory

Equip. NJID	Facility's Designation	Equipment Description	Equipment Type	Certificate Number	Install Date	Grand-Fathered	Last Mod. (Since 1968)	Equip. Set ID
E6102	R-6102	R-6102 Reactor System including R-6102, E-6102A, E-6102B, E-6102D, and WS-6102	Manufacturing and Materials Handling Equipment					
E6103	R-6102Feed	R-6102 Dry Material Feed System including BU-6102 and C-6102	Manufacturing and Materials Handling Equipment					
E6104	R-6105Feed	R-6105 Dry Material Feed System including BU-6105, C-6105, and H-6105	Manufacturing and Materials Handling Equipment					
E6105	R-6105	R-6105 Reactor System including R-6105, E-6105A, E-6105B, and E-6105C	Manufacturing and Materials Handling Equipment					
E6106	R-6101Drum	R-6101 Drum/tote container filling system	Manufacturing and Materials Handling Equipment					
E610100			Manufacturing and Materials Handling Equipment					

000000 E6102 (Manufacturing and Materials Handling Equipment)
Print Date: 12/2/2024

Make:	De Dietrich
Manufacturer:	De Dietrich
Model:	SA1500
Type of Manufacturing and Materials Handling Equipment:	Reactor
Capacity:	1.50E+03
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6103 (Manufacturing and Materials Handling Equipment)
Print Date: 12/2/2024

Make:	Custom
Manufacturer:	Custom
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Bulk Bag Unloader and Conveyor
Capacity:	3.00E+03
Units:	other units
Description (if other):	pounds/hour
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6104 (Manufacturing and Materials Handling Equipment)
Print Date: 12/2/2024

Make:	Hapman
Manufacturer:	Hapman
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Bulk Bag Unloader and Conveyor
Capacity:	3.00E+03
Units:	other units
Description (if other):	pounds/hour
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6105 (Manufacturing and Materials Handling Equipment)
Print Date: 12/2/2024

Make:	Tolan
Manufacturer:	Tolan
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Reactor
Capacity:	5.50E+03
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

000000 E6106 (Manufacturing and Materials Handling Equipment)
Print Date: 12/2/2024

Make:	Custom
Manufacturer:	Custom
Model:	Custom
Type of Manufacturing and Materials Handling Equipment:	Drum/tote filling system with floor scale
Capacity:	5.00E+02
Units:	gallons
Description (if other):	
Have you attached a diagram showing the location and/or the configuration of this equipment?	No
Have you attached any manuf.'s data or specifications to aid the Dept. in its review of this application?	No
Comments:	

Troy Chemical Corp (05459) Date: 1/6/2025

New Jersey Department of Environmental Protection
Control Device Inventory

CD NJID	Facility's Designation	Description	CD Type	Install Date	Grand-Fathered	Last Mod. (Since 1968)	CD Set ID
CD6102	SC-6102	Scrubber for BU-6102/C-6102	Scrubber (Multi-Stage)				
CD6105	SC-6105	Scrubber for BU-6105/C-6105	Scrubber (Multi-Stage)				
CD610100			Adsorber				

000000 CD6102 (Scrubber (Multi-Stage))
Print Date: 12/2/2024

Make:	Mapco
Manufacturer:	Mapco
Model:	300
Number of Stages:	1
Is the Scrubber Used for Particulate Control?	(●) Yes ( ) No
Is the Scrubber Used for Gas Control?	(●) Yes ( ) No
Is the Scrubber Equipped with a Mist Eliminator?	(●) Yes ( ) No
Minimum Pump Discharge Pressure (in. H20):	
Maximum Pump Discharge Pressure (in. H20):	
Method of Monitoring Pump Discharge Pressure:	
Minimum Pump Current (amps):	
Maximum Pump Current (amps):	
Method of Monitoring Pump Current:	
Minimum Scrubber Medium Inlet Pressure (in. H20):	
Minimum Operating Liquid Flow Rate (gpm):	4.00
Maximum Operating Liquid Flow Rate (gpm):	12.00
Method of Monitoring Liquid Flow Rate:	Visual gauge
Minimum Operating Gas Flow Rate (acfm):	
Maximum Operating Gas Flow Rate (acfm):	
Method of Monitoring Gas Flow Rate:	
Minimum Operating Pressure Drop (in. H20):	0.25
Maximum Operating Pressure Drop (in. H20):	12.00
Method of Monitoring Pressure Drop:	Visual gauge
Relative Direction of the Gas-Liquid Flow:	
Description:	
Maximum Inlet Gas Temperature (°F):	
Maximum Outlet Gas Temperature (°F):	
Inlet Particle Grain Loading (gr/dscf):	
Maximum Number of Sources Using this Apparatus as a Control Device (Include Permitted and Non-Permitted Sources):	2
Alternative Method to Demonstrate Control Apparatus is Operating Properly:	
Have you attached data from recent performance testing?	( ) Yes (●) No
Have you attached any manufacturer's data or specifications in support of the feasibility and/or effectiveness of this control apparatus?	( ) Yes (●) No
Have you attached a diagram showing the location and/or configuration of this control apparatus?	( ) Yes (●) No

000000 CD6102 (Scrubber (Multi-Stage))
Print Date: 12/2/2024

Comments:

000000 CD6105 (Scrubber (Multi-Stage))
Print Date: 12/2/2024

Make:	Mapco
Manufacturer:	Mapco
Model:	300-05-6r
Number of Stages:	1
Is the Scrubber Used for Particulate Control?	(●) Yes ( ) No
Is the Scrubber Used for Gas Control?	(●) Yes ( ) No
Is the Scrubber Equipped with a Mist Eliminator?	(●) Yes ( ) No
Minimum Pump Discharge Pressure (in. H20):	
Maximum Pump Discharge Pressure (in. H20):	
Method of Monitoring Pump Discharge Pressure:	
Minimum Pump Current (amps):	
Maximum Pump Current (amps):	
Method of Monitoring Pump Current:	
Minimum Scrubber Medium Inlet Pressure (in. H20):	
Minimum Operating Liquid Flow Rate (gpm):	4.00
Maximum Operating Liquid Flow Rate (gpm):	12.00
Method of Monitoring Liquid Flow Rate:	Visual Gauge
Minimum Operating Gas Flow Rate (acfm):	
Maximum Operating Gas Flow Rate (acfm):	
Method of Monitoring Gas Flow Rate:	
Minimum Operating Pressure Drop (in. H20):	0.25
Maximum Operating Pressure Drop (in. H20):	12.00
Method of Monitoring Pressure Drop:	Visual Gauge
Relative Direction of the Gas-Liquid Flow:	
Description:	
Maximum Inlet Gas Temperature (°F):	
Maximum Outlet Gas Temperature (°F):	
Inlet Particle Grain Loading (gr/dscf):	
Maximum Number of Sources Using this Apparatus as a Control Device (Include Permitted and Non-Permitted Sources):	2
Alternative Method to Demonstrate Control Apparatus is Operating Properly:	
Have you attached data from recent performance testing?	( ) Yes (●) No
Have you attached any manufacturer's data or specifications in support of the feasibility and/or effectiveness of this control apparatus?	( ) Yes (●) No
Have you attached a diagram showing the location and/or configuration of this control apparatus?	( ) Yes (●) No

000000 CD6105 (Scrubber (Multi-Stage))
Print Date: 12/2/2024

Comments:

Troy Chemical Corp (05459)

Date: 1/6/2025

New Jersey Department of Environmental Protection
Emission Points Inventory

PT NJID	Facility's Designation	Description	Config.	Equiv. Diam. (in.)	Height (ft.)	Dist. to Prop. Line (ft)	Exhaust Temp. (deg. F)			Exhaust Vol. (acfm)			Discharge Direction	PT Set ID
							Avg.	Min.	Max.	Avg.	Min.	Max.		
PT6102	R-6102 Stack	Discharge stack for R-6102/E-6102B	Round	3	30	50	100.0	60.0	120.0	200.0	150.0	300.0	Down	
PT6103	SC-6102Stack	Discharge stack for SC-6102 Scrubber	Round	8	25	50	70.0	60.0	100.0	1,000.0	1,000.0	1,000.0	Up	
PT6104	SC-6105Stack	Discharge stack for SC-6105 Scrubber	Round	6	23	50	70.0	60.0	100.0	250.0	150.0	500.0	Up	
PT6105	R-6105 Stack	Discharge stack for R-6105/E-6105B	Round	3	30	50	100.0	60.0	120.0	200.0	150.0	300.0	Down	
PT6106	6101DrumSys	Man door for R-6101 drum/tote system	Door	64	6	50	70.0	60.0	100.0	100.0	150.0	200.0	Horizontal	
PT6111	R-6101RD	Emergency stack for R-6101 Rupture Disk	Round	2	30	50	100.0	60.0	120.0	0.0	0.0	300.0	Up	
PT6112	R-6102RD	Emergency relief stack for R-6102 Rupture Disk	Round	2	30	50	100.0	60.0	120.0	0.0	0.0	300.0	Up	
PT6115	R-6105RD	Emergency relief stack for R-6105 Rupture Disk	Round	2	30	50	100.0	60.0	120.0	0.0	0.0	300.0		
PT610100			Round											
PT610101			Round											

Troy Chemical Corp (05459)

Date: 1/6/2025

New Jersey Department of Environmental Protection
Emission Unit/Batch Process Inventory

U 610100

UOS NJID	Facility's Designation	UOS Description	Operation Type	Signif. Equip.	Control Device(s)	Emission Point(s)	SCC(s)	Annual Oper. Hours		VOC Range	Flow (acfm)		Temp. (deg F)	
								Min.	Max.		Min.	Max.	Min.	Max.
OS4	R-6101	R-6101 Reactor System Operation	Normal - Steady State	E610100	CD610100 (P)	PT610101	3-01-033-20	0.0	6,000.0	A	0.0	15.0	30.0	140.0
OS5	R-6102	R-6102 reactor System Operation	Normal - Steady State	E6102	CD6102 (P)	PT6103	3-01-033-20	0.0	6,000.0	A	150.0	500.0	60.0	160.0
OS6	R-6105	R-6105 Reactor System Operation	Normal - Steady State	E6105	CD6105 (P)	PT6104	3-01-033-20	0.0	6,000.0	A	150.0	500.0		160.0
OS14	R-6101DrumSy	R-6101 Drum/Tote System	Normal - Steady State	E6106		PT6106	3-01-033-41	0.0	6,000.0	A	100.0	200.0	60.0	120.0
OS15	R-6102Feed	R-6102 Dry Material Feed System Operation	Normal - Steady State	E6103	CD6102 (P)	PT6103	3-01-033-32	0.0	6,000.0	A	1,000.0	1,000.0	70.0	70.0
OS16	R-6105Feed	R-6105 Dry Material Feed System Operation	Normal - Steady State	E6104	CD6105 (P)	PT6104	3-01-033-32	0.0	6,000.0	A	150.0	500.0	60.0	120.0

000000 U610100 OS4 (Gas Flow)
Print Date: 1/6/2025

Volume of Gas Discharged from this source (acfm):	15.00

000000 U610100 OS4 (Raw Materials)
Print Date: 1/6/2025

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Powders		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

000000 U610100 OS4 (Efficiency Table (CD610100))
Print Date: 1/6/2025

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
CO			
HAP (Total)			
NOx			
Other (Total)			
Pb			
PM-10			
PM-2.5			
SO2			
TSP			
VOC (Total)	100.00	80.00	80.00

000000 U610100 OS5 (Gas Flow)
Print Date: 12/2/2024

Volume of Gas Discharged from this source (acfm):	500.00

000000 U610100 OS5 (Raw Materials)
Print Date: 12/2/2024

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Methyl alcohol (Methanol)	00067-56-1	Liquid	32.040	Yes				lb/gal
Non-HAP Particulate		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

000000 U610100 OS5 (Scrubber Multi Stage - CD6105)
Print Date: 12/2/2024

Stage	Liquid Recirculation Method	Liquid Being Used for Adsorption	Chemical Additive in Scrubbing Medium	Minimum Concentration of Chemical Additive	Maximum Concentration of Chemical Additive	How is the Activity of the Scrubbing Medium Maintained?	Maximum pH
1							

	Min Ph (	Max Oxi Re	Min Oxi Redu
	Minimum pH	**Maximum Oxidation Reduction Potential (mV)**	**Minimum Oxidation Reduction Potential (mV)**

000000 U610100 OS5 (Efficiency Table - CD6105)
Print Date: 12/2/2024

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
Pb			
PM-10			
PM-2.5			
SO2			
TSP			
VOC (Total)			
Formaldehyde	100.00	99.99	99.99
Methanol	100.00	99.99	99.99
CO			
HAP (Total)			
NOx			
Other (Total)			

000000 U610100 OS6 (Gas Flow)
Print Date: 12/2/2024

Volume of Gas Discharged from this source (acfm):	500.00

000000 U610100 OS6 (Raw Materials)
Print Date: 12/2/2024

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Methyl alcohol (Methanol)	00067-56-1	Liquid	32.040	Yes				lb/gal
Non-HAP Particulate		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

000000 U610100 OS6 (Efficiency Table - CD6105)
Print Date: 12/2/2024

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
CO			
HAP (Total)			
NOx			
Other (Total)			
Pb			
PM-10			
PM-2.5			
SO2			
TSP			
VOC (Total)			
Formaldehyde	100.00	99.99	99.99
Methanol	100.00	99.99	99.99

000000 U610100 OS14 (Raw Materials)
Print Date: 12/2/2024

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Ethylene glycol	00107-21-1	Liquid	62.070	Yes				lb/gal
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Powders		Solid		No				
Non-HAP VOC		Liquid		Yes				lb/gal

000000 U610100 OS14 (Gas Flow)
Print Date: 12/2/2024

Volume of Gas Discharged from this source (acfm):	15.00

000000 U610100 OS15 (Gas Flow)
Print Date: 12/2/2024

Volume of Gas Discharged from this source (acfm):	1,000.00

000000 U610100 OS15 (Raw Materials)
Print Date: 12/2/2024

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Particulate		Solid		No				

000000 U610100 OS15 (Efficiency Table - CD6102)
Print Date: 12/2/2024

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
CO			
HAP (Total)			
NOx			
Other (Total)			
Pb			
PM-10	100.00	99.00	99.00
PM-2.5	100.00	99.00	99.00
SO2			
TSP	100.00	99.00	99.00
VOC (Total)			
Formaldehyde	100.00	99.99	99.99

000000 U610100 OS15 (Scrubber Multi Stage - CD6102)
Print Date: 12/2/2024

Stage	Liquid Recirculation Method	Liquid Being Used for Adsorption	Chemical Additive in Scrubbing Medium	Minimum Concentration of Chemical Additive	Maximum Concentration of Chemical Additive	How is the Activity of the Scrubbing Medium Maintained?	Maximum pH
1	Recirculated		NaOH	0.50	5.00	pH	14.0

	Min Ph (	Max Oxi Re	Min Oxi Redu
	Minimum pH	**Maximum Oxidation Reduction Potential (mV)**	**Minimum Oxidation Reduction Potential (mV)**
	7.0		

000000 U610100 OS16 (Raw Materials)
Print Date: 12/2/2024

Raw Material	CAS Number	Physical State	Molecular Weight (lbs/lbs-mole)	Does the Material Contain VOC?	Weight Fraction (%)	Vapor Pressure @ 70 deg F (mmHg)	Organic Density	Units
Formaldehyde	00050-00-0	Solid		Yes				lb/ft^3
Non-HAP Particulate		Solid		No				

000000 U610100 OS16 (Gas Flow)
Print Date: 12/2/2024

Volume of Gas Discharged from this source (acfm):	500.00

000000 U610100 OS16 (Efficiency Table - CD6105)
Print Date: 12/2/2024

Pollutant Category	Capture Efficiency (%)	Removal Efficiency (%)	Overall Efficiency (%)
CO			
HAP (Total)			
NOx			
Other (Total)			
Pb			
PM-10	100.00	99.00	99.00
PM-2.5	100.00	99.00	99.00
SO2			
TSP	100.00	99.00	99.00
VOC (Total)			
Formaldehyde	100.00	99.99	99.99

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: U610100

Operating Scenario: OS0 Summary

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	tons/yr	No
PM-10 (Total)			D	D	tons/yr	No
TSP			D	D	tons/yr	No
VOC (Total)			0.06160000	0.06160000	tons/yr	No

Subject Item: U610100

Operating Scenario: OS4

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)		D	D	D	lb/hr	No
PM-10 (Total)		D	D	D	lb/hr	No
TSP		D	D	D	lb/hr	No
VOC (Total)		0.07700000	0.07700000	0.07700000	lb/hr	No

Subject Item: U610100

Operating Scenario: OS5

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)		D	D	D	lb/hr	No
VOC (Total)		0.07600000	0.07600000	0.07600000	lb/hr	No

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: **U610100**

Operating Scenario: **OS6**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)		D	D	D	lb/hr	No
VOC (Total)		0.06100000	0.06100000	0.06100000	lb/hr	No

Subject Item: **U610100**

Operating Scenario: **OS14**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	lb/hr	No
VOC (Total)		0.12200000	0.12200000	0.12200000	lb/hr	No

Subject Item: **U610100**

Operating Scenario: **OS15**

Step:

Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	lb/hr	No
PM-10 (Total)		D	D	D	lb/hr	No
TSP		D	D	D	lb/hr	No

New Jersey Department of Environmental Protection
Potential to Emit

Subject Item: **U610100**

Operating Scenario: **OS16**

Step:

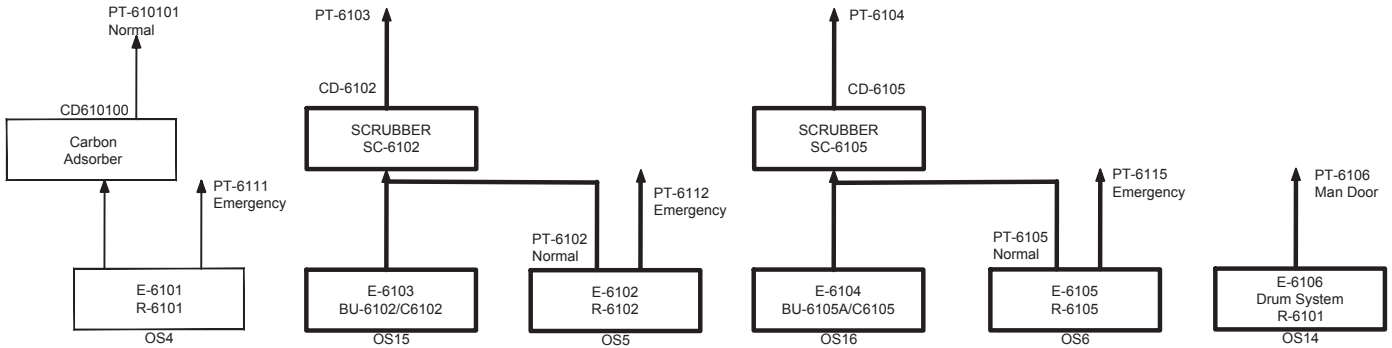
Air Contaminant Category (HAPS)	Fugitive Emissions	Emissions Before Controls	Emissions After Controls	Total Emissions	Units	Alt. Em. Limit
HAPs (Total)			D	D	lb/hr	No
PM-10 (Total)		D	D	D	lb/hr	No
TSP		D	D	D	lb/hr	No

Appendix III

Air Flow Block Diagram

EMISSION UNIT U61

BUILDING 61 MANUFACTURING



KEY

REPRESENTS NEWLY ADDED OPERATING SCENARIOS

REPRESENTS EXISTING OPERATING SCENARIO

776 Mountain Blvd, Suite 105
Watchung, NJ 07069
Phone: (908) 508-9000 Fax: (908) 508-9101

TITLE:

BUILDING 61 MANUFACTURING AIR FLOW BLOCK DIAGRAM

CLIENT:	**Troy Chemical**
SITE:	**Newark, NJ**
DATE:	**11/27/24**
DRAWN BY:	**DLK**
SCALE:	**NTS**
JOB NO:	**J24057**

FIGURE:

1