TPC Group
Houston Operations

TEL 713.477.9211
FAX 713.475.6008

8600 Park Place Boulevard, Houston, Texas 77017
www.tpcgrp.com

February 26, 2020

Air Permits Initial Review Team (APIRT)
Texas Commission on Environmental Quality
Mail Code 163
12100 Park 35 Circle
Austin, Texas 78753

RE: TCEQ Air Quality New Source Review Permit Amendment Applications
TPC Group, LLC - Houston Plant
NSR Permit Nos. 46307, 46426, and 22052
Customer Reference Number (CN): 603624289
Regulated Entity Number (RN):

To Whom It May Concern:

TPC Group LLC (TPC) currently owns and operates the Houston Plant, a petrochemical production facility located in Houston, Texas at 8600 Park Place Blvd. TPC Group LLC has been assigned Texas Commission on Environmental Quality (TCEQ) Customer Reference Number (CN) CN603624289. The Houston Plant has been assigned TCEQ Regulated Entity Reference Number (RN) 100219526 and TCEQ Air Quality Account Number HG-0562-P.

With this submittal, TPC requests to authorize a butadiene (BD) capacity increase and reliability improvement project (BD expansion). The BD expansion will include units authorized under New Source Review (NSR) Permit Nos. 46307, 46426, and 22052. Therefore, a separate amendment application is being included for each permit. However, all new, modified, and affected sources are evaluated under one Federal New Source Review (FNSR) Analysis and one Air Quality Analysis (AQA).

TPC requests to expedite all three permit amendment applications. Associated capital costs for the BD expansion project will be greater than $7.5 million. Therefore, one permit application fee in the amount of $75,000 and one expedited processing fee of 20,000 have been submitted under separate cover to the TCEQ Revenue Section.

Confidential information is being submitted under a separate cover.

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If you have any questions regarding this submittal or require additional information, please feel free to contact me at (713) 475-7409.

Sincerely,

Jason T. Sanders
TPC Environmental Manager

Attachments

cc: TCEQ Regional Office, Region 12
Bureau Chief of Pollution Control and Prevention, Environmental Health Division, City of Houston
Harris County Pollution Control Services Department, Harris County

NNSR/PSD PERMIT APPLICATION

TPC Group LLC > Houston Plant

TPC Group
Houston Operations

Permit No. 46307

Prepared By:

TRINITY CONSULTANTS
Trinity Consultants
1800 West Loop South
Suite 1000
Houston, TX 77027
(713) 552-1371

February 2020

Project No. 194402.0098

Trinity Consultants

Environmental solutions delivered uncommonly well

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1. EXECUTIVE SUMMARY

TPC Group LLC (TPC) currently owns and operates the Houston Plant, a petrochemical production facility located in Houston, Texas at 8600 Park Place Blvd. TPC Group LLC has been assigned Texas Commission on Environmental Quality (TCEQ) Customer Reference Number (CN) CN603624289. The Houston Plant has been assigned TCEQ Regulated Entity Reference Number (RN) 100219526 and TCEQ Air Quality Account Number HG-0562-P.

With this submittal, TPC requests to amend New Source Review (NSR) Permit No. 46307 to authorize a butadiene (BD) capacity increase and reliability improvement project (BD expansion). The BD expansion project will involve the construction of new units and modifications to existing units. Emissions sources include cooling towers, storage tanks, fugitive components, wastewater, railcar loading, and maintenance, startup, and shutdown (MSS) activities. In addition to amending NSR 46307, the project affects units permitted under NSR Permit Nos. 22052 and 46426. Therefore, TPC is submitting all three amendment applications concurrently, and evaluating all new, modified, and affected sources under one Federal New Source Review (FNSR) Analysis and one Air Quality Analysis (AQA) found within this submittal.

The Houston Plant is located in Harris County, which is classified as serious non-attainment area for ozone and an attainment or unclassified area for all other criteria pollutants with respect to the National Ambient Air Quality Standards (NAAQS). The proposed project triggers Nonattainment New Source Review (NNSR) permitting requirements for volatile organic compounds (VOC). In addition, the proposed project triggers Prevention of Significant Deterioration (PSD) permitting requirements for particulate matter (PM), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and Greenhouse Gas (GHG). All other pollutant emission increases are less than major modification triggering thresholds.

Supporting documentation for this application is provided in the following sections. Included in Section 2 of this permit application is Form PI-1 General Application and Table 2 Material Balance. A Microsoft Excel copy of the Form PI-1 General Application is also submitted electronically. An area map and plot plan are included in Sections 3 and 4, respectively. A brief process description is provided in Section 5. Emission calculations are discussed in Section 6. FNSR applicability is covered in Section 7. The summary of Federal Best Available Control Technology (BACT), State BACT, and Federal Lowest Achievable Emission Rate (LAER) reviews are provided in Sections 8 and 9. Section 10 provides an air quality analyses overview. Section 11 discusses NNSR requirements. A review of general application requirements is provided in Section 12. The associated permit application fee and expedited processing fee has been submitted under separate cover to the TCEQ Revenue Section and a copy of the permit fee check is included in Section 13 for reference, along with the Professional Engineer (P.E.) Certification. In addition, the following information is provided in the attached appendices of this application:

- Appendix A – Emissions Calculations
- Appendix B – FNSR Analysis
- Appendix C – BACT/LAER Search Results
- Appendix D – TCEQ Equipment Forms

Form PI-1 General Application

Texas Commission on Environmental Quality
Form PI-1 General Application
General

Date: February 2020
Permit #: 46307
Company: TPC Group LLC

I. Applicant Information	
I acknowledge that I am submitting an authorized TCEQ application workbook and any necessary attachments. Except for inputting the requested data and adjusting row height and column width, I have not changed the TCEQ application workbook in any way, including but not limited to changing formulas, formatting, content, or protections.	I agree

A. Company Information

Company or Legal Name:	TPC Group LLC

Permits are issued to either the facility owner or operator, commonly referred to as the applicant or permit holder. List the legal name of the company, corporation, partnership, or person who is applying for the permit. We will verify the legal name with the Texas Secretary of State at (512) 463-5555 or at:

https://www.sos.state.tx.us

Texas Secretary of State Charter/Registration Number (if given):	

B. Company Official Contact Information: must not be a consultant

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Michael
Last Name:	Bankston
Title:	Plant Manager
Mailing Address:	8600 Park Place Boulevard
Address Line 2:	
City:	Houston
State:	Texas
ZIP Code:	77017
Telephone Number:	713-475-7709
Fax Number:	713-475-6008
Email Address:	Michael.Bankston@tpcgrp.com

C. Technical Contact Information: This person must have the authority to make binding agreements and representations on behalf of the applicant and may be a consultant. **Additional technical contact(s) can be provided in a cover letter.**

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Jason
Last Name:	Sanders
Title:	EHSS Environmental Manager
Company or Legal Name:	TPC Group LLC
Mailing Address:	8600 Park Place Boulevard
Address Line 2:	
City:	Houston
State:	Texas
ZIP Code:	77017
Telephone Number:	713-475-7409
Fax Number:	
Email Address:	Jason.Sanders2@tpcgrp.com

D. Assigned Numbers

The CN and RN below are assigned when a Core Data Form is initially submitted to the Central Registry. The RN is also assigned if the agency has conducted an investigation or if the agency has issued an enforcement action. If these numbers have not yet been assigned, leave these questions blank and include a Core Data Form with your application submittal. See Section VI.B. below for additional information.

Enter the CN. The CN is a unique number given to each business, governmental body, association, individual, or other entity that owns, operates, is responsible for, or is affiliated with a regulated entity.	CN603624289

Enter the RN. The RN is a unique agency assigned number given to each person, organization, place, or thing that is of environmental interest to us and where regulated activities will occur. The RN replaces existing air account numbers. The RN for portable units is assigned to the unit itself, and that same RN should be used when applying for authorization at a different location.	RN100219526

II. Delinquent Fees and Penalties

Does the applicant have unpaid delinquent fees and/or penalties owed to the TCEQ? This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: https://www.tceq.texas.gov/agency/financial/fees/delin	No

III. Permit Information

A. Permit and Action Type (multiple may be selected, leave no blanks)

Additional information regarding the different NSR authorizations can be found at:
https://www.tceq.texas.gov/permitting/air/guidance/authorize.html

Select from the drop-down the type of action being requested for each permit type. **If that permit type does not apply, you MUST select "Not applicable".**

Provide all assigned permit numbers relevant for the project. Leave blank if the permit number has not yet been assigned.

Permit Type	Action Type Requested (do not leave blank)	Permit Number (if assigned)
Minor NSR (can be a Title V major source): *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Relocation/Alteration, Change of Location, Alteration, Extension to Start of Construction*	Amendment	46307
Special Permit: *Not applicable, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
De Minimis: *Not applicable, Initial*	Not applicable	
Flexible: *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
PSD: *Not applicable, Initial, Major Modification*	Major Modification	46307
Nonattainment: *Not applicable, Initial, Major Modification*	Major Modification	46307
HAP Major Source [FCAA § 112(g)]: *Not applicable, Initial, Major Modification*	Not applicable	
PAL: *Not applicable, Initial, Amendment, Renewal, Renewal/Amendment, Alteration*	Not applicable	
GHG PSD: *Not applicable, Initial, Major Modification, Voluntary Update*	Not applicable	

B. MSS Activities

How are/will MSS activities for sources associated with this project be authorized?	This permit

C. Consolidating NSR Permits

Will this permit be consolidated into another NSR permit with this action?	No
Will NSR permits be consolidated into this permit with this action?	No

D. Incorporation of Standard Permits, Standard Exemptions, and/or Permits By Rule (PBR)

To ensure protectiveness, previously issued authorizations (standard permits, standard exemptions, or PBRs) including those for MSS, are incorporated into a permit either by consolidation or by reference. At the time of renewal and/or amendment, consolidation (in some cases) may be voluntary and referencing is mandatory. More guidance regarding incorporation can be found in 30 TAC § 116.116(d)(2), 30 TAC § 116.615(3) and in this memo:

https://www.tceq.texas.gov/assets/public/permitting/air/memos/pbr_spc06.pdf

Are there any standard permits, standard exemptions, or PBRs to be incorporated by reference?	No
Are there any PBR, standard exemptions, or standard permits associated to be incorporated by consolidation? **Note:** Emission calculations, a BACT analysis, and an impacts analysis must be attached to this application at the time of submittal for any authorization to be incorporated by consolidation.	No

E. Associated Federal Operating Permits

Is this facility located at a site required to obtain a **site operating permit (SOP)** or **general operating permit (GOP)?**	Yes
Is a **SOP** or **GOP** review pending for this source, area, or site?	No
If required to obtain a **SOP** or **GOP**, list all associated permit number(s). If no associated permit number has been assigned yet, enter "TBD":	SOP 1598

IV. Facility Location and General Information	
A. Location	
County: Enter the county where the facility is physically located.	Harris
TCEQ Region	Region 12
County attainment status as of Sept. 23, 2019	Serious Ozone nonattainment
Street Address:	8600 Park Place Blvd.
City: If the address is not located in a city, then enter the city or town closest to the facility, even if it is not in the same county as the facility.	Houston
ZIP Code: Include the ZIP Code of the physical facility site, not the ZIP Code of the applicant's mailing address.	77017
Site Location Description: If there is no street address, provide written driving directions to the site. Identify the location by distance and direction from well-known landmarks such as major highway intersections.	
Use USGS maps, county maps prepared by the Texas Department of Transportation, or an online software application such as Google Earth to find the latitude and longitude.	
Latitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Latitude is the angular distance of a location north of the equator and will always be between 25 and 37 degrees north (N) in Texas.	29.699166
Longitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Longitude is the angular distance of a location west of the prime meridian and will always be between 93 and 107 degrees west (W) in Texas.	95.253888
Is this a project for a lead smelter, concrete crushing facility, and/or a hazardous waste management facility?	No
B. General Information	
Site Name:	Houston Plant
Area Name: Must indicate the general type of operation, process, equipment or facility. Include numerical designations, if appropriate. Examples are Sulfuric Acid Plant and No. 5 Steam Boiler. Vague names such as Chemical Plant are not acceptable.	Houston Plant - Butadiene (BD) Unit
Are there any schools located within 3,000 feet of the site boundary?	Yes

C. Portable Facility	
Permanent or portable facility?	Permanent

D. Industry Type	
Principal Company Product/Business:	1,3 Butadiene, MTBE, Isobutylene, and Other C4 Products
A list of SIC codes can be found at: https://www.naics.com/sic-codes-industry-drilldown/	
Principal SIC code:	2869
NAICS codes and conversions between NAICS and SIC Codes are available at: https://www.census.gov/eos/www/naics/	
Principal NAICS code:	325100

E. State Senator and Representative for this site	
This information can be found at (note, the website is not compatible to Internet Explorer): https://wrm.capitol.texas.gov/	
State Senator:	Carol Alvarado
District:	6
State Representative:	Mary Ann Perez
District:	144

V. Project Information

A. Description	
Provide a brief description of the project that is requested. (Limited to 500 characters).	TPC is requesting to amend NSR Permit No. 46307 to authorize planned modfications at the Houston Plant in conjunction with the BD expansion project.

B. Project Timing	
Authorization must be obtained for many projects before beginning construction. Construction is broadly interpreted as anything other than site clearance or site preparation. Enter the date as "Month Date, Year" (e.g. July 4, 1776).	
Projected Start of Construction:	4th Quarter 2021
Projected Start of Operation:	1st Quarter 2022

C. Enforcement Projects	
Is this application in response to, or related to, an agency investigation, notice of violation, or enforcement action?	No

D. Operating Schedule	
Will sources in this project be authorized to operate 8760 hours per year?	Yes

VI. Application Materials

All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. (30 TAC § 116.116)	
A. Confidential Application Materials	
Is confidential information submitted with this application?	Yes

If yes, is each confidential page marked "CONFIDENTIAL" in large red letters?	Yes
THSC §382.041 requires us not to disclose any information related to manufacturing processes that is marked Confidential. Mark any information related to secret or proprietary processes or methods of manufacture Confidential if you do not want this information in the public file. All confidential information should be separated from the application and submitted as a separate file. Additional information regarding confidential information can be found at: https://www.tceq.texas.gov/permitting/air/confidential.html	
B. Is the Core Data Form (Form 10400) attached?	No
https://www.tceq.texas.gov/assets/public/permitting/centralregistry/10400.docx	
C. Is a current area map attached?	Yes
Is the area map a current map with a true north arrow, an accurate scale, the entire plant property, the location of the property relative to prominent geographical features including, but not limited to, highways, roads, streams, and significant landmarks such as buildings, residences, schools, parks, hospitals, day care centers, and churches?	Yes
Does the map show a 3,000-foot radius from the property boundary?	Yes
D. Is a plot plan attached?	Yes
Does your plot plan clearly show a north arrow, an accurate scale, all property lines, all emission points, buildings, tanks, process vessels, other process equipment, and two bench mark locations?	Yes
Does your plot plan identify all emission points on the affected property, including all emission points authorized by other air authorizations, construction permits, PBRs, special permits, and standard permits?	Yes
Did you include a table of emission points indicating the authorization type and authorization identifier, such as a permit number, registration number, or rule citation under which each emission point is currently authorized?	N/A
E. Is a process flow diagram attached?	Yes
Is the process flow diagram sufficiently descriptive so the permit reviewer can determine the raw materials to be used in the process; all major processing steps and major equipment items; individual emission points associated with each process step; the location and identification of all emission abatement devices; and the location and identification of all waste streams (including wastewater streams that may have associated air emissions)?	Yes
F. Is a process description attached?	Yes
Does the process description emphasize where the emissions are generated, why the emissions must be generated, what air pollution controls are used (including process design features that minimize emissions), and where the emissions enter the atmosphere?	Yes
Does the process description also explain how the facility or facilities will be operating when the maximum possible emissions are produced?	Yes
G. Are detailed calculations attached? Calculations must be provided for each source with new or changing emission rates. For example, a new source, changing emission factors, decreasing emissions, consolidated sources, etc. You do not need to submit calculations for sources which are not changing emission rates with this project. Please note: the preferred format is an electronic workbook (such as Excel) with all formulas viewable for review. It can be emailed with the submittal of this application workbook.	Yes
Are emission rates and associated calculations for planned MSS facilities and related activities attached?	Yes
H. Is a material balance (Table 2, Form 10155) attached?	Yes

Table 2 (Form 10155), entitled Material Balance: A material balance representation may be required for all applications to confirm technical emissions information. Typically this is required for refining and chemical manufacturing processes involving reactions, separations, and blending. It may also be requested by the permit reviewer for other applications. Table 2 should represent the total material balance; that is, all streams into the system and all streams out. Additional sheets may be attached if necessary. Complex material balances may be presented on spreadsheets or indicated using process flow diagrams. All materials in the process should be addressed whether or not they directly result in the emission of an air contaminant. All production rates must be based on maximum operating conditions.	
I. Is a list of MSS activities attached?	Yes
Are the MSS activities listed and discussed separately, each complete with the authorization mechanism or emission rates, frequency, duration, and supporting information if authorized by this permit?	Yes
J. Is a discussion of state regulatory requirements attached, addressing 30 TAC Chapters 101, 111, 112, 113, 115, and 117?	Yes
For all applicable chapters, does the discussion include how the facility will comply with the requirements of the chapter?	Yes
For all not applicable chapters, does the discussion include why the chapter is not applicable?	Yes
K. Are all other required tables, calculations, and descriptions attached?	Yes

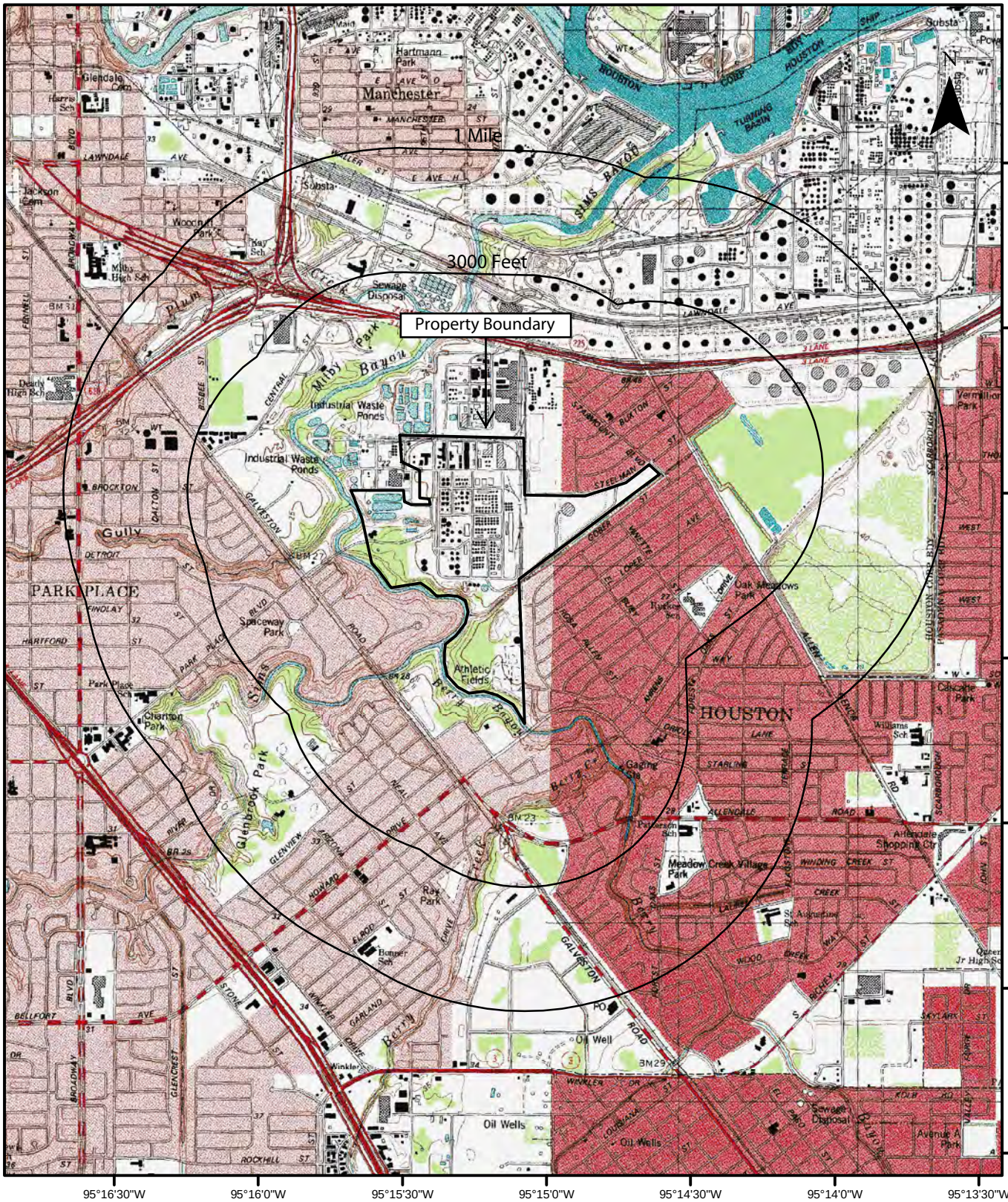
VII. Signature

The owner or operator of the facility must apply for authority to construct. The appropriate company official (owner, plant manager, president, vice president, or environmental director) must sign all copies of the application. The applicant's consultant cannot sign the application. **Important Note: Signatures must be original in ink, not reproduced by photocopy, fax, or other means, and must be received before any permit is issued.**

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382; the Texas Clean Air Act (TCAA); the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name:	Michael Bankston
Signature:	
Original signature is required.	
Date:	

3. AREA MAP



Scales

0 1,000 2,000 3,000 4,000 5,000

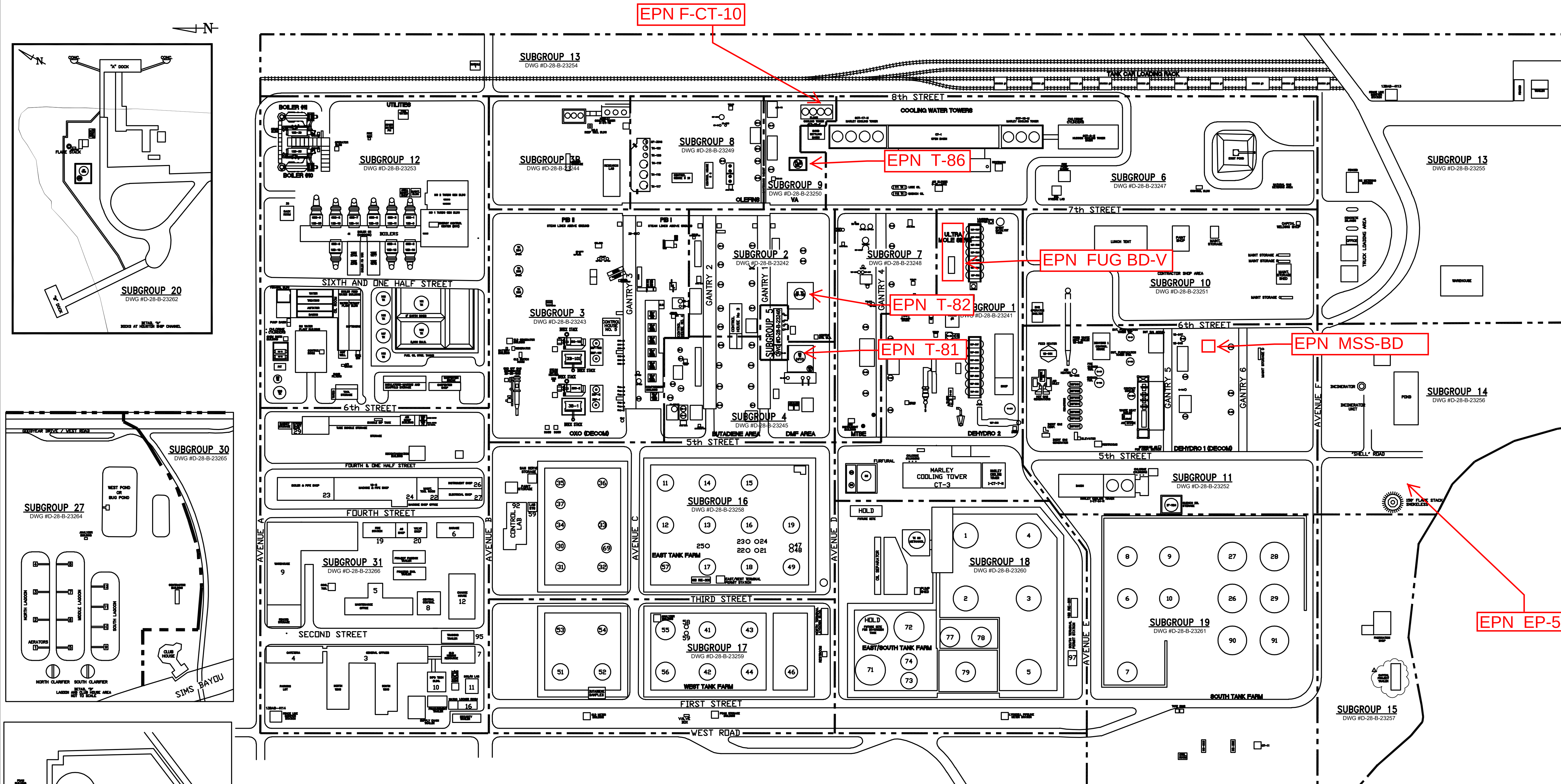
Feet

0 500 1,000 1,500 2,000

Meters

Trinity Consultants

4. PLOT PLAN



REFERENCE DRAWINGS

	...P GENERAL SITE KEY PLAN
	...P 1 GENERAL ARRANGMENT
D-28-B-2324...	...P 2 GENERAL ARRANGMENT
D-28-B-23243	SUBGROUP 3 GENERAL ARRANGMENT
D-28-B-23244	SUBGROUP 3B GENERAL ARRANGMENT
	...ROUP 4 GENERAL ARRANGMENT
	...ROUP 5 GENERAL ARRANGMENT
	...ROUP 6 GENERAL ARRANGMENT
D-28-B-23248	SUBGROUP 7 GENERAL ARRANGMENT
D-28-B-23249	SUBGROUP 8 GENERAL ARRANGMENT
D-28-B-23250	SUBGROUP 9 GENERAL ARRANGMENT
D-28-B-23251	SUBGROUP 10 GENERAL ARRANGMENT
D-28-B-23252	SUBGROUP 11 GENERAL ARRANGMENT
D-28-B-23253	SUBGROUP 12 GENERAL ARRANGMENT
D-28-B-23254	SUBGROUP 13 GENERAL ARRANGMENT
...5	SUBGROUP 13 GENERAL ARRANGMENT
...6	SUBGROUP 14 GENERAL ARRANGMENT
...7	SUBGROUP 15 GENERAL ARRANGMENT
D-28-B-23258	SUBGROUP 16 GENERAL ARRANGMENT
D-28-B-23259	SUBGROUP 17 GENERAL ARRANGMENT
D-28-B-23260	SUBGROUP 18 GENERAL ARRANGMENT
D-28-B-23261	SUBGROUP 19 GENERAL ARRANGMENT
D-28-B-23262	SUBGROUP 20 GENERAL ARRANGMENT
D-28-B-23263	SUBGROUP 21 GENERAL ARRANGMENT
D-28-B-23264	SUBGROUP 27 GENERAL ARRANGMENT
D-28-B-23265	SUBGROUP 30 GENERAL ARRANGMENT
D-28-B-23266	SUBGROUP 31 GENERAL ARRANGMENT

CHARGE	DRAWN	CHECKED	APPROVAL	APPROVAL	APPROVAL	APPROVAL	APPROVAL	DATE	DESCRIPTION OF ISSUE	REV.
MOC-3737	ARC							3/6/19	MAKE CAPITAL PROJECT TRAILER PERMANENT PER MOC-3737	16
EXPENSE	ARC							10/3/17	GENERAL UPDATE	15
EXPENSE	ARC							7/20/17	ADDED FENCE LINE MONITOR BUILDING NUMBERS	14

[redacted]

HNO - SUBGROUP 28
TPC GROUP
TPC GROUP GENERAL SITE PLOT PLAN
KEY PLAN

SCALE:	DRAWING NO.:	REVISION
1"=100'-0"	D-28-B-8082	16

LAST UPDATE: 8/19/19 PLOT: 8/23/19 9:55:50 AM

TPC 24x36 (Nov-7-2012)

5. PROCESS DESCRIPTION & PROCESS FLOW DIAGRAM

5.1. PROCESS DESCRIPTION

TPC owns and operates a petrochemical production facility in Houston, Harris County, Texas. The plant currently manufactures various light olefin products including butadiene, methyl-tert-butyl ether (MTBE), butenes, diisobutylene (DIB), isobutylene, and polyisobutylene (PIB). Production at the Houston Facility occurs through several units, including the Butadiene Unit, the Raffinate MTBE Unit, Butene-1 Unit, the DIB unit, and the PIB unit. Along with process units, the Houston Plant operates several associated utility sources (e.g. boilers, cooling towers, etc.).

5.2. PROJECT DESCRIPTION

With this submittal, TPC requests to amend NSR Permit No. 46307 to authorize a butadiene (BD) capacity increase and reliability improvement project (BD expansion). The BD expansion will include the authorization of equipment for the ethyl-tert-butyl-ether (ETBE) and iso-octene (IC8) projects. New equipment and activities required for the BD expansion under NSR Permit No. 46307 include but are not limited to the following:

- Construct new towers, heat exchangers, condensate pots, centrifugal pumps and a holding drum for ETBE production;
- Construct new towers and a floating roof tank for the project;
- Debottleneck the vinyl acetylene (VAU) unit;
- Replace vent gas recovery system compressor;
- Reuse existing pressurized tank TK57 for furfural wash water storage;
- Improve reliability of system operations for the North Absorber;
- Install new pumps for anticipated pipeline business changes;
- Relocate PIB railcar loading to new spur;
- Reuse existing pressurized tank TK 8 to receive additional Raff;
- Authorize storage of IC8 in existing floating roof tank TK 115;
- Construct new pressurized tank for additional BD storage;
- Add Polygas production representation; and
- Authorize new fugitive components in support of all BD expansion activities.
- Increase marine loading throughputs and construct a thermal oxidizer, Raff pump, and fugitive components (NSR Permit No. 22052 amendment); and
- Construct a new boiler (NSR Permit No. 46426 amendment).

The project will result in new sources of emissions including fugitive components, MSS activities, and a floating roof tank (EPNs FUG-BD-V, MSS-BD, MSS-FLR, and TK-2D6 respectively). A new PIB railcar loading spur will be constructed but will not result in an increase of emissions, nor constitute a physical change or change in method of operation. Existing equipment authorized under NSR Permit No. 46307 that will be modified in support of the BD expansion project include a cooling tower (EPN F-CT-10) and storage tanks (EPNs T-81, T-82, and T-86). Although wastewater components will not be modified, TPC is requesting an update to its permit representations to account for pre-existing chemical constituents (EPNs F-10A and WW-PN). New and modified process equipment (e.g. towers) will be routed to the fuel gas system as primary controls and the plant flare as backup when the vent compressor is down. TPC is also requesting to decrease emissions from the flare (EPN EP-5).

In addition to changes taking place under NSR Permit No. 46307, the BD expansion project will result in changes at the Cogen Permit (NSR Permit No. 46426) and the Dock Permit (NSR Permit No. 22052). Changes to the Cogen

Permit include the construction of one new boiler rated at 664 MMBtu/hr (EPN Boiler 12) and the shutdown and decommissioning of one existing boiler (EPN EP-H9). Boiler 12 will be fueled by a combination of natural and plant fuel gas. Plant fuel consists of vinyl acetylene unit (VAU) off gas, Dehydro No. 2 (DH2) off gas, and Plant off gas. No other sources authorized under Permit No. 46246 will be modified for this project.

New equipment to be authorized under the Dock Permit includes fugitive components (EPN FUG-BD-D), a Raff pump and a thermal oxidizer (EPN DOCK-TO). The thermal oxidizer will replace the existing dock flare (EPN E-563) as the primary mode of control for products loaded at the docks. The flare will remain at the facility to be used for maintenance, start-up, and shutdown (MSS) purposes when the thermal oxidizer is offline. Additionally, TPC requests to update product loading throughputs at the dock which will result in a change of authorized uncaptured loading emissions (EPN C-5). No other sources authorized under Permit No. 22052 will be modified for this project.

All remaining sources authorized under NSR Permit Nos. 46307, 46426, and 22052 are conservatively assumed to be affected sources. Table 5-1 shows all new and modified equipment included in the scope of this project.

Table 5-1. New and Modified Equipment

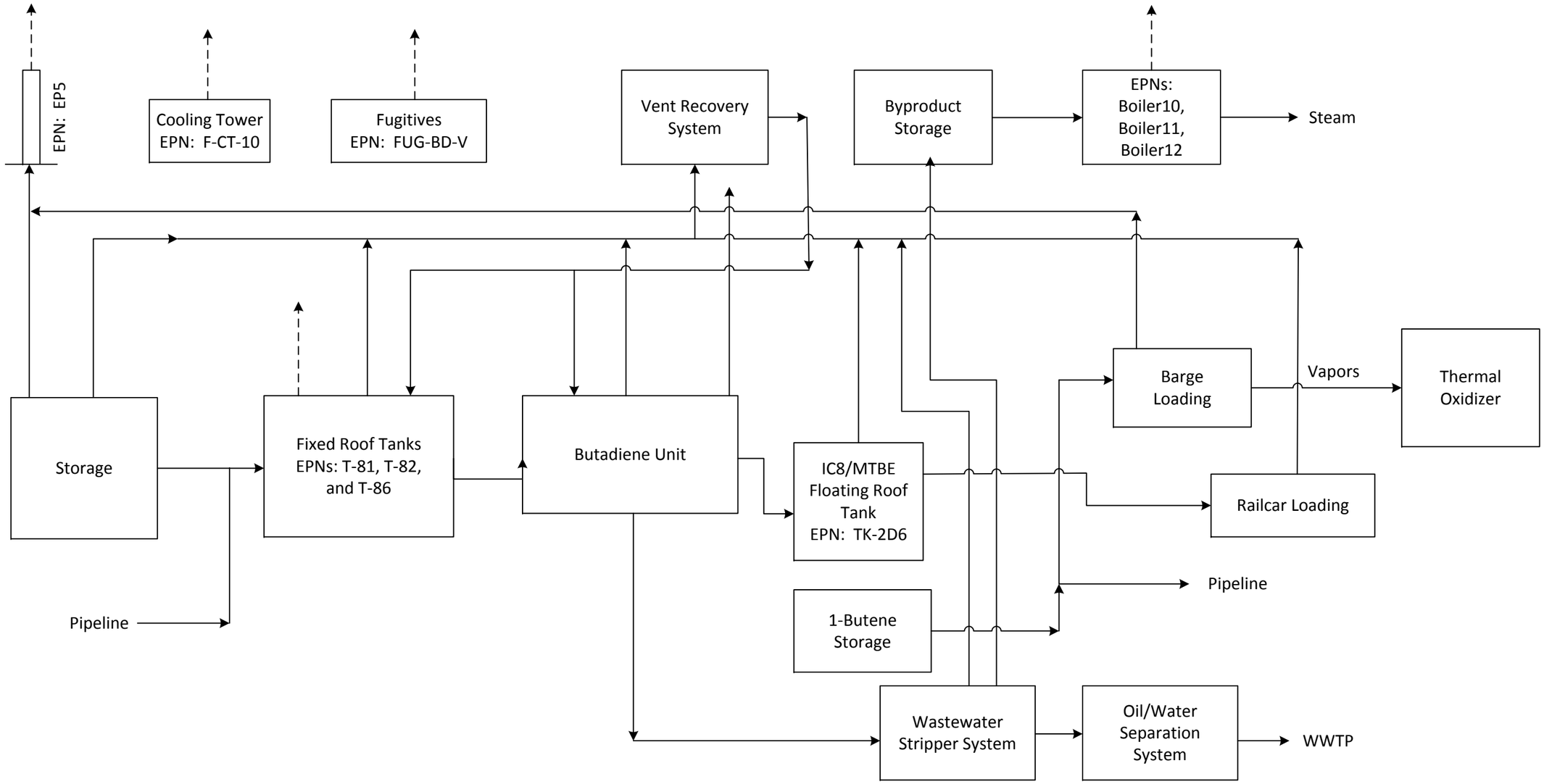
NSR Authorization	EPN	Equipment Description	Equipment Designation
46307	FUG-BD-V	Process Fugitives	New
46307	TK-2D6	IFR MTBE/DIB/ETBE/IC8 Tank	New
46307	MSS-FLR	TK-2D6 Degass Flare	New
46307	MSS-BD	Vessel Openings	New
46307	F-CT-10	Cooling Tower	Modified
46307	T-81	Furfural/Water Tank	Modified
46307	T-82	Dimethyl Formamide Tank	Modified
46307	T-86	Furfural/Water Tank	Modified
46307	T-115	IFR MTBE/ETBE/IC8 Tank	Modified
46307	-	Process Vents	New - Routed to fuel gas system as primary control, flare as backup
46307	-	ETBE Towers	New
46307	-	ETBE Heat Exchangers	New
46307	-	ETBE Condensate Pots	New
46307	-	ETBE Centrifugal Pumps	New – Included as part of EPN FUG-BD-V.
46307	-	Methanol Holding drum	New
46307	-	IC8 Towers	New
46307	-	Vent Gas Recovery System Compressor	New – Included as part of EPN FUG-BD-V.
46307	-	Furfural/Water Tank 57	Modified pressurized tank – No emissions
46307	-	4D2 Condenser Set, Reboiler Bundles, Forced Recirculation	New – No emissions
46307	-	Pipeline Pumps	New – included as part of EPN FUG-BD-V.

NSR Authorization	EPN	Equipment Description	Equipment Designation
46307	-	PIB Railcar Spur	Change of location
46307	-	Raff Tank 8	Modified pressurized tank – No emissions
46307	-	BD Tank	New pressurized tank– No emissions
46307	-	BD Pump	New – No emissions
22052	DOCK-TO	Dock Thermal Oxidizer	New
22052	FUG-BD-D	Docks Fugitives	New
22052	-	Raff Pump	New – Included as part of EPN FUG-BD-D.
46426	Boiler 12	Boiler 12 (664 MMBtu/hr)	New

5.3. PROCESS FLOW DIAGRAM

Figure 5-1 is a process flow diagram for the proposed projects at the Houston Plant.

Figure 5-1 TPC HNO - Process Flow Diagram



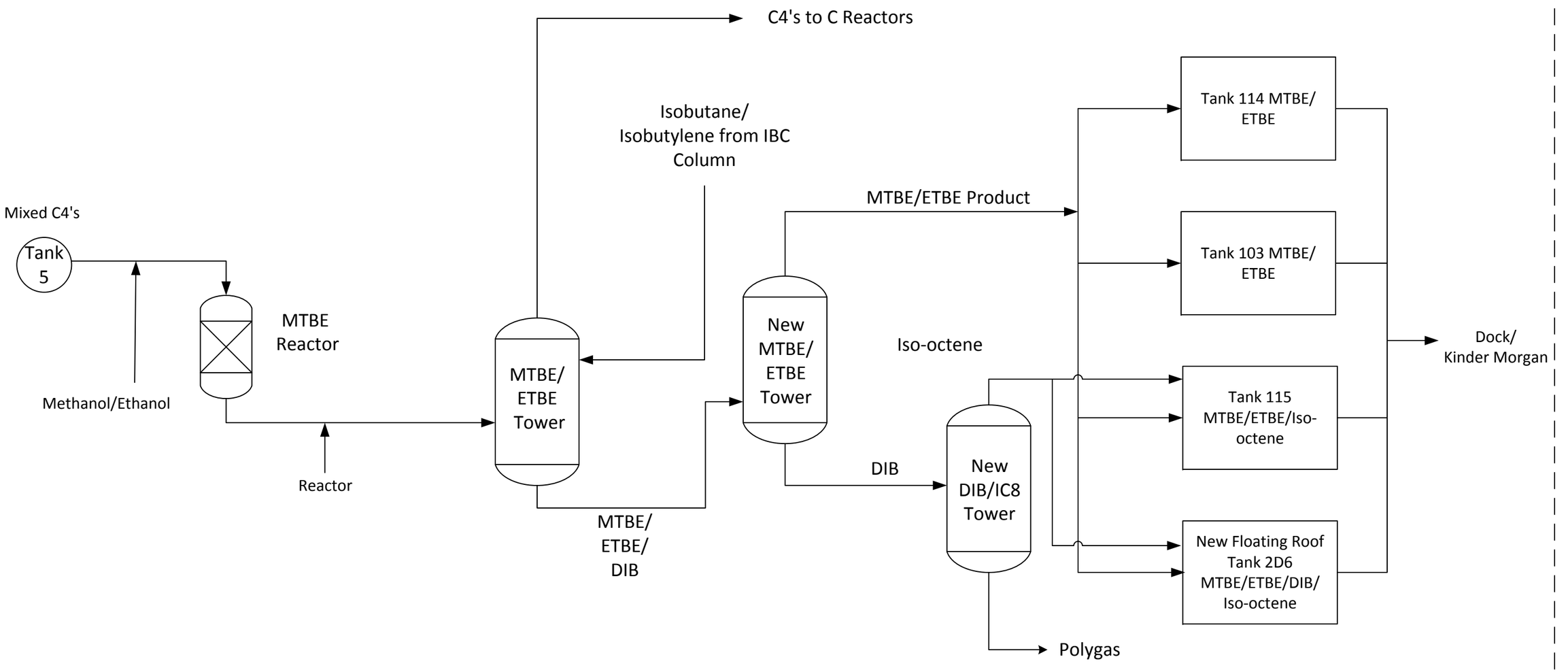
TPC Group LLC

Houston Plant
Butadiene Process Flow Diagram

Trinity Consultants

Project 194402.0113
February 2020

EPNs: MSS-BD, MSS-FLR



TPC Group LLC.
Houston Plant

Co-Production of MTBE/ETBE and Iso-octene/DIB
Process Flow Diagram

Trinity Consultants

Project 194402.0098
February 2020

The following sections contain a detailed description of emission calculations for new and modified emission points at the Houston Plant to be authorized under this permit. Detailed emission calculations and sample calculations are provided in Appendix A.

6.1. PROCESS VENTS

The process vents resulting from the construction of new towers and process vessels as part of this project will be routed to the fuel gas system as primary control and to the process flare when the vent compressor is down. As part of this project, improvements in equipment reliability such as the vapor compressor will result in a decrease of emissions from the flare.

6.2. STORAGE TANKS (EPNS T-81, T-82, T-86, TK-2D6, T-115)

The hourly emissions for fixed roof tanks are calculated using *TCEQ Guidance Document - Estimating Short Term Emission Rates from Fixed Roof Tanks (February 2018)*. Hourly emissions for the floating roof tank are based on *TCEQ Guidance Document - Short Term Emission Rates from Floating Roof Storage Tanks (February 2018).* The annual emissions are calculated in accordance with AP-42 Chapter 7, Section 7.1. Both hourly and annual emissions are based on the composition of the material being stored. Furthermore, the vapor pressure and molecular weight of vapor is based on the chemical properties of material being loaded at the maximum expected temperatures on an hourly basis and average temperatures for annual emissions.

6.3. COOLING TOWER (EPN F-CT-10)

Emissions from the cooling towers include VOC, PM, PM_{10}, and $PM_{2.5}$. The cooling tower will be equipped with a drift eliminator to control PM, PM_{10}, and $PM_{2.5}$ emissions. The drift eliminator has an efficiency of 0.0005%. PM emissions with an efficiency of 0.0005 wt. % pursuant to Federal BACT are based on the recirculating water flow rate, the liquid drift total dissolved solids concentration, and the maximum drift rate. The PM_{10} and $PM_{2.5}$ emissions are estimated based on published particle size distributions. VOC emissions are based on water recirculating water flow rate and a proposed LAER VOC detection limit for cooling towers of 0.042 ppmw.

6.4. FUGITIVE COMPONENTS (EPN FUG-BD-V)

VOC fugitive emissions were calculated using the methodology described in the *TCEQ Air Permit Technical Guidance for Chemical Sources – Fugitive Guidance (June 2018)*. Fugitive emission factors for synthetic organic chemical manufacturing industry (SOCMI) without ethylene were selected. Control efficiencies from TCEQ's 28LAER Leak Detection and Repair (LDAR) monitoring program will be applied for all new process fugitive components in VOC service.

6.5. MSS ACTIVITIES (EPNS MSS-BD, MSS-FLR)

MSS activities will be performed periodically on newly installed equipment. The frequency/event duration of maintenance activities varies for different equipment types. These planned and predictable maintenance activities include equipment degassing routed to control, and uncontrolled equipment openings. New equipment will include towers, heat exchangers, pumps, drums, condensate pots, and a floating roof tank. Process equipment will vent to an existing plant flare. MSS activities from the floating roof tank will be routed to a

portable flare. Equipment clearing from new equipment like towers, drums, etc., is based on the vessel volume and a 500 ppmv organic concentration. Additional details are provided in Appendix A.

6.6. WASTEWATER (EPNS WW-PN, EPN F-10A)

The Houston Plant performed a reassessment of its wastewater treatment plant (WWTP) and as a result of the proposed project outlined in this report, the WWTP will result in an increase in its maximum allowable emission rates for the aerations ponds/clarifiers (EPN WW-PN) and the oil-water separator (EPN F-10A). As discussed in the pre-application meeting with the TCEQ, the increase in emissions is not related to this project and is not due to any physical or operational change and is therefore not a modification subject to nonattainment control requirements.

The Toxchem model (Version 4.4, April 2019) was used to estimate air emissions from the WWTP. The increase in emissions is due to the following changes to the WWTP: 1) updated contaminant concentrations and flowrates for the wastewater influent stream 2) adding user-defined compounds to the Toxchem compound database to accurately model compounds detected in the WWTP 3) adjusting WWTP unit parameters such as the mixed liquor suspended solids (MLSS) concentrations in the aeration ponds to reflect actual operations and 4) evaluating multiple operating scenarios.

The proposed flow rates and contaminant concentrations for the modeled wastewater influent stream were determined based on historical data and accounting the additional flows to the WWTP as a result from the BD Unit Amendment projects.

There are thirteen (13) chemicals expected in the wastewater treatment system. Of the thirteen chemicals, “octadiene” and “isobutane” were added to the Toxchem chemical database (i.e., user-defined chemicals). The chemical properties for these user-defined compounds were obtained from the chemical/scientific databases (i.e., Chemspider/PubChem/Yaws). Additionally, the Henry’s Law Constant for Furfural was revised based on Appendix J of the proposed and promulgated rule for Standards of Performance for New Stationary Sources (NSPS) - Volatile Organic Compound Emissions from the Synthetic Organic Chemical Manufacturing Industry Wastewater (Docket# A-94-32).

The proposed maximum hourly and annual VOC emissions are based on the operating scenario with the highest emissions.

7.1. NNSR AND PSD APPLICABILITY ANALYSIS

As mentioned in Section 1, the Houston Plant is located in Harris County, which is nonattainment for ozone and attainment for all other FNSR pollutants. The Houston Plant is considered a major source under the (1) NNSR program for ozone with NO_X and VOC being the applicable precursors, and (2) PSD program for all other FNSR pollutants.

In addition to this permit application for the construction and authorization of new and modified equipment under NSR Permit No. 46307, TPC is submitting two separate concurrent permit applications for the proposed project (NSR Permit Nos. 22052 and 46426). As a result, TPC is considering the emissions from all three permit applications together for evaluation under one set of FNSR thresholds. As a result, TPC is subject to the relevant 30 TAC Chapter 116 requirements that require NNSR analyses for NO_X and VOC, and PSD analyses for SO_2, PM, PM_{10}, $PM_{2.5}$, CO, and CO_2e. A detailed review of the NNSR and PSD applicability analyses for the proposed projects are provided below with additional details included in Appendix B.

The NNSR and PSD applicability analyses are being conducted for the new, modified, and affected sources. New units resulting in project emissions increases (PEIs) include a boiler, thermal oxidizer, floating roof tank, fugitive components, and various MSS actives. Modified units consist of a cooling tower, fixed roof storage tanks, and uncaptured and controlled marine loading emissions. All remaining authorized units were conservatively assumed to be affected by the project. To determine whether the proposed project would result in a major modification, as defined by the PSD/NNSR rules, PEIs for modified and affected sources were calculated as the potential to emit (PTE) minus the baseline actual emission (BAE) rate. PEIs for new units are equal to their PTEs. The following steps outline the BAE to PTE methodology:

Step 1. Establish Baseline Period Emissions

The baseline period for an existing facility is any consecutive 24-month period within the 10-year period immediately preceding either the date the owner or operator begins construction of the project, or the date of a complete permit application submitted to the TCEQ. Therefore, the 10 years immediately preceding the date of construction were reviewed to identify the consecutive 24-month period with the highest emissions for each affected pollutant. The period from January 1, 2017 to December 31st, 2018 was used for calculation of baseline actual emissions for all affected FNSR pollutants.

Step 2. Calculate Baseline Actual Emissions

Baseline actual emissions for modified/affected units, in tons per year, are determined from annual emissions from continuous emissions monitoring systems (CEMS), current emission factors, and other sources.

Step 3. Calculate Potential to Emit

PTEs represent the maximum capacity of source to emit a pollutant under its physical and operational design. PTEs for modified sources were determined using the permit basis calculation methodology along with updated parameters being submitted in this permit amendment. PTEs for affected sources represent their currently authorized federally enforceable limits.

Step 4. Calculate Project Increases

PEIs for modified and affected sources were calculated as the PTE minus the BAE rate. PEIs for new units are equal to their PTEs.

VOC and NO_X PEIs resulting from the proposed project were compared to their respective NNSR significant emissions rate (SER). As shown in Table 7-1 below, the emission increases for VOC and NO_X are above their NNSR SERs. NNSR permitting requirements were triggered for VOC. Contemporaneous netting was performed for NO_X to net out of NNSR review. The other regulated pollutants are compared to the PSD SERs to determine PSD applicability.

The proposed emissions of SO_2 and CO are less than the applicable SER; therefore, no further PSD review is required for these pollutants. However, the emissions of PM, PM_{10}, $PM_{2.5}$ and CO_2e are greater than the corresponding SERs, as shown in Table 7-1 below. Hence, the emission increases trigger PSD for PM, PM_{10}, $PM_{2.5}$, and CO_2e. Contemporaneous netting was performed for PM, PM_{10} and $PM_{2.5}$ to satisfy air quality analysis requirements. Additional PSD permitting requirements are addressed in the following sections. Appendix B also contains supporting documentation for the FNSR Analysis such as the FNSR TCEQ Tables 1F, 2F, 3F, and 4F.

Table 7-1. NNSR/PSD Applicability Summary

	CO (tpy)	NO_X (tpy)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)	SO_2 (tpy)	CO2e (tpy)
VERP Permit No. 46307	10.21	2.27	3.39	2.30	0.04	60.61	0.00	7
Cogen Permit No. 46426	21.49	29.08	21.67	21.67	21.67	8.96	3.26	267,734
Dock Permit No. 22052	2.75	3.67	1.37	1.37	1.37	2.42	0.08	6,754
Project Emissions Increase	34.45	35.02	26.42	25.34	23.08	71.99	3.34	274,494
PSD/NNSR Significant Emission Rate	100	25	25	15	10	25	40	75,000
PSD/NNSR Netting Performed?	No	Yes	Yes	Yes	Yes	No	No	No
Contemporaneous Emissions Change	0.00	-290.38	24.84	24.05	21.95	0.00	0.00	0.00
Net Emissions Increase (NEI)	0.00	-255.36	51.26	49.38	45.03	0.00	0.00	0.00
PSD/NNSR Review Required?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**

7.2. NETTING

7.2.1. Contemporaneous Project Netting

As discussed in Section 7-1, contemporaneous netting was performed for NO_X, PM, PM_{10}, and $PM_{2.5}$ project emissions to demonstrate that the net emissions increase (NEI) for NO_X from the project is below its SER and satisfy PSD air quality analysis requirements for PM, PM_{10}, and $PM_{2.5}$.

Contemporaneous netting includes creditable emissions increases and decreases during the contemporaneous netting window. For conservatism, netting was performed 5 years from the date of submittal (February 2020). Hence, creditable reductions/increases were evaluated from January 2015 along with any future anticipated creditable reductions that would occur before the proposed project's start of operation. The proposed start of construction for the proposed project is the fourth quarter of 2021. The proposed start of operation is the first quarter of 2022.

7.2.2. Creditable NO_X Reductions

The contemporaneous changes for NO_X emissions include the shutdown of one boiler (EPN EP-H9) authorized under NSR Permit No. 46426. Creditable reductions for these heaters are based on 24-month baseline average emissions as reported in Emission Inventory Reports. All creditable emission reductions are identified in Table 3F for NO_X. All listed emission reduction activities will be in place prior to the startup of the proposed project.

7.2.3. Project Timeline

The start of construction for the proposed project is the fourth quarter of 2021 and scheduled to operate after completion in the first quarter of 2022. The shutdown of Boiler 9 (EPN -EP-H9) will be completed before the start of operation.

8. LOWEST ACHIEVABLE EMISSION RATE (LAER)

Title 30 TAC §116.150(d)(1) specifies that new and modified stationary sources in nonattainment areas must comply with the lowest achievable emission rate (LAER) for the specific pollutant for which nonattainment new source review (NNSR) is being conducted. LAER is defined in 30 TAC §116.12 as:

> *(A) the most stringent emission limitation that is contained in the rules and regulations of any approved state implementation plan for a specific class or category of facility, unless the owner or operator of the proposed facility demonstrates that such limitations are not achievable; or*
>
> *(B) the most stringent emission limitation that is achieved in practice by a specific class or category of facilities, whichever is more stringent.*

The LAER review takes technical feasibility into account but not economic reasonableness, which is considered in a Best Available Control Technology (BACT) analysis.

The Houston Plant is located in Harris County which is a part of the Houston Galveston Brazoria (HGB) area, designated as serious nonattainment for ozone. NO_X and VOC are the regulated precursors to ozone. VOC emissions from this project exceed the NNSR major source threshold of 25 tpy, with NO_X emissions netting out based on creditable decreases. Therefore, the proposed project's new and modified sources are subject to a LAER analysis for VOC only. The main aspect considered when determining LAER for VOC emissions was the most stringent emission limitation that is achieved in practice by a specific class or category of facilities as found in a search of the Reasonably Achievable Control Technology (RACT)/BACT/LAER (RBLC) database.

LAER candidates were identified through a search of the following:

- EPA's RBLC Database;
- CA's Clearinghouse;
- Bay Area Air Quality Management District (BAAQMD) Guidance;
- South Coast Air Quality Management District (SCAQMD) Guidance; and
- TCEQ Tier I BACT and Technical Guidance.

The data obtained through these searches was combined and then sorted to identify LAER candidates. These results are presented in Appendix C of this application.

For the proposed project, the LAER analysis presented below follows this methodology to determine LAER limits for VOC from each new and modified emission point.

8.1. VOC LAER ANALYSIS

8.1.1. Process Vents

The BD expansion project will include process vents from new columns and other process equipment described in Section 5. Table 8-1 below summarizes control measures identified during the LAER analysis.

Table 8-1 – Process Vent VOC Control Findings

Source	Description
EPA RBLC	Route process vents to thermal oxidizer, boiler, etc.
CA Clearinghouse	No Entries Identified
BAAQMD Guidance	Control with 95%; 85% of emissions must be controlled by 98%.
SCAQMD Guidance	Route reactor vents to carbon absorber, afterburner, condenser, or scrubber. Control resin manufacturing vents by 95%.
TCEQ Tier I BACT/ Technical Guidance	Route to flare, any oxidizer, adsorber, absorber/scrubber, etc.

Review of the findings indicates LAER as control of VOC process vents to a combustion device such as a thermal oxidizer or boiler with a minimum 99.9% VOC destruction efficiency.

TPC proposes as LAER routing the vents to the fuel gas system (e.g. the boilers authorized under NSR Permit No. 46426), which achieves a greater than 99.9% destruction efficiency. Routing to the fuel gas system will serve as the primary mode of control. When the fuel gas vapor recovery compressors are down, process vents are routed to a flare as back up control. The back up controls are expected to last no more than 200 hours per year, and the backup flare will meet all requirements of 40 CFR 60.18. The flare has a 99% destruction efficiency for species with less than three carbon atoms and a 98% destruction efficiency for species with three or more carbon atoms.

8.1.2. Fixed Roof Storage Tanks (EPNS T-81, T-82, T-86)

The BD expansion project will include three fixed roof tanks. Tanks T-81 and T-86 store a mixture of furfural and water. Tank T-82 stores dimethyl formamide. The VOC partial pressure for these products will always be low, less than 0.1 psia at all daily maximum liquid surface temperatures. Table 8-2 below summarizes control measures identified during the LAER analysis for fixed roof tanks storing low vapor pressure products.

Table 8-2 – Fixed Roof Storage Tank VOC Control Findings

Source	Description
EPA RBLC	Storage of SOCMII Liquids - Fixed Roof Tanks Best Maintenance Practices
CA Clearinghouse	20,000 gallons or greater Annual throughput does not exceed 6,327,000 gallons (materials with a vapor pressure less than 0.10 psia @ 70F do not count towards this limit). No carcinogenic materials stored in the tank per Rule 1401 (DMF is considered a toxic material). All tanks are vented to a thermal oxidizer (assumed 95% destruction efficiency for VOC).
BAAQMD Guidance	Fixed roof tanks exempt from vapor control for materials < 0.5 psia.
SCAQMD Guidance	No additional controls for fixed roof tanks for materials < 0.1 psia.
TCEQ Tier I BACT/ Technical Guidance	Fixed roof with submerged fill. Uninsulated exterior surfaces exposed to the sun shall be white or aluminum.

All documentation provides consistent guidance for fixed roof tanks storing low vapor pressure products.

Based on the LAER review conducted, TPC is proposing LAER for EPNs T-81, T-82, and T-86 as fixed roof tanks painted white with submerged fill for all tanks containing material with a VOC partial vapor pressure of less than 0.1 psi.

8.1.3. Internal Floating Roof Storage Tank (EPN TK-2D6, T-115)

Tank TK-2D6 will have operational flexibility to store MTBE, DIB, IC8, or ETBE; and tank T-115 will store MTBE, IC8, or ETBE; all having vapor pressures greater than 0.1 psia. Table 8-3 below summarizes control measures identified during the LAER analysis for the storage of materials greater than 0.1 psia in vapor pressure.

Table 8-3 – Internal Floating Roof Storage Tank VOC Control Findings

Source	Description
EPA RBLC	Internal floating roof with mechanical shoe primary seal and a rim mounted secondary seal. Deck is welded with gaskets on all deck appurtenances.
CA Clearinghouse	No entries identified
BAAQMD Guidance	Achieved in Practice: Approved roof w/liquid mounted primary seal and zero gap secondary seal. Also, no ungasketed roof penetrations, no slotted pipe guide pole unless equipped with float and wiper seals, and no adjustable roof legs unless fitted w/ vapor seal boots or equivalent
SCAQMD Guidance	Floating roof with primary/secondary seals.
TCEQ Tier I BACT/ Technical Guidance	Internal floating roof tank with primary seal mechanical/liquid or primary seal vapor mounted with secondary seal rim mounted.

For materials with a vapor pressure of greater than 0.5 psia, TPC proposes LAER as an internal floating roof tank with a vapor mounted primary seal and a secondary seal rim mounted.

8.1.4. Cooling Tower (EPN F-CT-10)

VOC emissions from the cooling tower will result through non-contact liquid drift of the cooling water which contains some VOC from the process.

To identify potential VOC control technologies for the cooling towers, TPC reviewed the information listed in Table 8-4.

Table 8-4 – Cooling Tower VOC Control Findings

Source	Description
EPA RBLC	Indirect design. 42 ppbw leak action level.
CA Clearinghouse	No entries identified
BAAQMD Guidance	0.042 ppmw leak action level. Weekly monitoring.
SCAQMD Guidance	No entries identified
TCEQ Tier I BACT/ Technical Guidance	Non-contact design. Monthly VOC monitoring. Repair identified leaks as soon as possible, but before next scheduled shutdown, or shutdown triggered by 0.08 ppmw cooling water VOC concentration.

Review of the resources for the control of cooling tower VOC emissions identified the monitoring of the VOC content in the cooling water weekly combined with repair of leaking heat exchangers as the most stringent method of VOC control.

Based on the LAER review conducted, TPC is proposing LAER as being consistent with BAAQMD Regulation 11 Rule 10's guidance of 0.042 ppmw VOC as the leak action level before leak repairs occur. TPC's proposed LAER is more stringent than TCEQ's Tier I BACT of 0.08 ppmw.

8.1.5. Fugitives (EPN FUG-BD-V)

VOC emissions from fugitive components will result through equipment leaks from new process components in VOC service. TPC is proposing to follow TCEQ's 28LAER to satisfy LAER for equipment leak fugitives. 28LAER is the most stringent LDAR program developed by TCEQ and was established to satisfy the NNSR LAER requirements. 28LAER will be conducted on all regulated components in VOC service that are new as part of this project.

8.1.6. MSS (EPNS MSS-BD, EPN-FLR)

New equipment related to the BD expansion as described in Section 5 will result in vessel clearing MSS activities. The only new emissions associated with these sources will be once the vessels are opened to atmosphere (EPN MSS-BD), which will only occur once the vapor space of the vessels is at a VOC concentration of 500 ppmv or less.

A review of the LAER references did not return any specific BACT or LAER requirements for MSS vessel opening. Therefore, TPC proposes opening the vessel to atmosphere at or below a VOC concentration of 500 ppmv as LAER. Note that this threshold is much lower than TCEQ's Tier I BACT requirement of 10,000 ppmv for uncontrolled MSS emissions from tank cleaning.

Additionally, this project will authorize MSS emissions from the floating roof tank (EPN TK-2D6), which will require degassing for maintenance activities to be performed, represented as EPN MSS-FLR. The only BACT or LAER requirements found in the LAER review comes from the TCEQ Tier I BACT for floating roof tanks.

TPC proposes the TCEQ Tier I BACT requirements as LAER. During degassing and refilling, TPC will route vapors to a portable flare.

9. BEST AVAILABLE CONTROL TECHNOLOGY

This section of the application presents the Best Available Control Technology analysis as required by Federal Clean Air Act and TCEQ regulatory requirements. PSD regulations require Best Available Control Technology (BACT) review for all new equipment that emit any of the pollutants that have the potential to be emitted at significant enough quantities to trigger a PSD review. Both Federal regulations under 40 CFR §52.21(j) and State regulations under 30 TAC Chapter 116 require that Best Available Control Technology (BACT) be applied to reduce or eliminate air emissions from a new or modified facility. Pursuant to 30 TAC §116.160 and 40 CFR §52.21(b) (12) PSD BACT is defined as:

"an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. (EPA 1990)"

9.1. BACT METHODOLOGY

EPA has developed a five step "top-down" process that can be used to ensure that a BACT analysis satisfies the applicable legal criteria. While the TCEQ has historically followed the three-tier process, the result from using either process should result in the same outcome. TPC has elected to use the "top-down" process for its PSD BACT analysis, as provided in TCEQ document entitled "*Air Permit Reviewer Reference Guide - Air Pollution Control*" (2011) where applicable TCEQ's Tier 1 BACT guidelines are also presented. The "top-down" PSD BACT evaluation consists of the following steps:

- Step 1 – Identify All Control Options
- Step 2 - Eliminate Technically Infeasible Options
- Step 3 – Rank Remaining Control Options
- Step 4 – Evaluation of Most Effective Control Option
- Step 5 – Select BACT

As indicated in Section 7, the emissions of PM, PM_{10}, $PM_{2.5}$, and GHG exceed the applicable SERs (Significant Emission Rates). Therefore, PSD BACT must be determined for each emission unit at the facility that emits PM, PM_{10}, $PM_{2.5}$, or GHG. Although Section 7 addressed emissions from new and modified facilities from all three concurrent permit applications, the BACT section will address units authorized under each respective permit. Therefore, only $PM/PM_{10}/PM_{2.5}$ from cooling towers will be addressed below. Additionally. since the area is nonattainment for ozone, NO_X and VOC emissions were covered in the LAER analysis section.

9.2. PM/PM_{10}/$PM_{2.5}$ BACT ANALYSIS

9.2.1. Cooling Tower (EPN F-CT-10)

9.2.1.1. Step 1 – Identify All Control Technologies

To identify potential PM/PM_{10}/$PM_{2.5}$ control technologies for the flares, TPC reviewed the following information:

- EPA's RACT / BACT / LAER Clearinghouse (RBLC) (past 10 years); and
- TCEQ's Tier I BACT.

Review of the resources identified the following as control technologies for PM control from cooling towers.

Table 9-1 – Cooling Tower PM/PM_{10}/$PM_{2.5}$ Control Findings

Source	Description
EPA RBLC	Drift eliminators with Drift rates 0.0005%; 0.001%; 0.003%;
TCEQ Tier I BACT/ Technical Guidance	Drift < 0.001% achieved by drift eliminators

9.2.1.1. Step 2 – Eliminate Technologically Infeasible Options

The use of drift eliminators is considered technically feasible, so no options are eliminated.

9.2.1.2. Step 3 – Rank Remaining Control Technologies

The only feasible control measure is the use of drift eliminators. Therefore, ranking is not required.

9.2.1.3. Step 4 – Evaluate Most Effective Controls

Since drift eliminators are the only control option listed, cost analysis is not required.

9.2.1.4. Step 5 – Select BACT

TPC is proposing to install drift eliminators and limit drift from the cooling towers to 0.0005% drift rate. The proposed drift rate is more stringent than TCEQ's Tier I BACT of 0.001%.

9.3. GHG BACT ANALYSIS

The potential emissions for GHG from the proposed project, expressed as CO_2e, will be greater than 75,000 tons which triggers PSD BACT review as described in EPA's Greenhouse Gas Tailoring Rule and subsequent case law (See *UARG v. EPA,* L.Ed. 2d 372 (2014)). Pursuant to EPA regulation, the project is subject to a GHG BACT review which is included below for GHG pollutants from each of the proposed sources.

In addition to the control options identified in each of the sections below, TPC also considered carbon capture and sequestration (CCS) as a potential GHG control option. CCS includes CO_2 capture and/or compression transport, and storage. However, this technology is appropriate for natural gas processing, ammonia production, and power generation industries where streams with a high CO_2 concentration exist. Additionally,

transportation and storage of the CO_2 is not technically available for the proposed sources. For these reasons, CCS is not a technically feasible control option for the proposed sources and is not discussed in the following sections.

9.3.1. Flare (EPN MSS-FLR)

GHG emissions from the MSS flare are produced from the combustion of carbon-containing VOCs. Since the flare itself is a control device for VOC emissions, additional controls are not practicable. Potential GHG control options for the flares are analyzed in the following sections.

9.3.1.1. Step 1 – Identify All Control Technologies

To identify potential GHG control technologies for the flare, TPC reviewed the following information:

- EPA's RACT / BACT / LAER Clearinghouse (RBLC) (past 10 years); and
- General GHG Permitting Guidance.

The table below summarizes generally accepted methods for minimizing GHG emissions from flares.

Table 9-1. Potential GHG Control Technologies for Flares

Control Option	Description
Low Carbon Fuel Selection	The pilot gas fuel for the flares will be limited to natural gas fuel. Natural gas has the lowest carbon intensity of any available fuel.
Good Combustion, Operating, Maintenance Practices	The flares will be operated in compliance with the manufacturer recommendations.

9.3.1.2. Step 2 – Eliminate Technologically Infeasible Options

The identified control options are technically feasible for the proposed flares.

9.3.1.3. Step 3 – Rank Remaining Control Technologies

No ranking of the control technologies is required since TPC will implement all of the control technologies identified.

9.3.1.4. Step 4 – Evaluate Most Effective Controls

This step is not required since all of the control technologies identified are being proposed as BACT for GHG from the flares.

9.3.1.5. Step 5 – Select BACT

TPC proposes the following as BACT for GHG from the flares:

- Use of natural gas in the flare pilots
- Following good combustion, operating, and maintenance practices.

TPC proposes the use of these work practice standards as the BACT limit for the flares.

9.4. STATE ONLY BACT ANALYSIS

9.4.1. Wastewater (EPNS WW-PN, EPN F-10A)

The Houston Plant performed a reassessment of its wastewater treatment plant resulting in an increase in its maximum allowable emission rates for the aerations ponds/clarifiers (EPN WW-PN) and the oil-water separator (EPN F-10A). As discussed in the pre-application meeting with the TCEQ, the increase in emissions is not related to this project and is not due to any physical or operational change and is therefore not a modification subject to nonattainment control requirements. TPC will therefore meet the TCEQ state BACT requirements.

TCEQ Tier I BACT for wastewater facilities is shown in Table 9-2. TPC's current wastewater system meets all of the specified requirements.

Table 9-2 – Wastewater VOC BACT

Source	Description
TCEQ Tier I BACT/ Technical Guidance	Applicable for organics and inorganics. Uncontrolled site-wide wastewater emissions > 5 tpy VOC: stripped gases from pretreatment routed to a control device, collection system hard piped/covered conveyance to biological treatment unit vented to a control device, wastewater treatment system must be at least 90 percent efficient.

10.1. MODELING ANALYSIS

An air quality analysis has been performed in support of this permit amendment application to demonstrate compliance with all applicable air quality standards using an appropriate air dispersion model. The main purpose of this analysis is to demonstrate that the emission points at the Houston Plant, in conjunction with other applicable emissions from existing sources, will not cause or contribute to a violation of any applicable National Ambient Air Quality Standards (NAAQS) or PSD Increment. Significance modeling of the emission rates from the new/modified emission points indicate that impacts from PM_{10} and $PM_{2.5}$ are below the Significance Impact Levels (SILs) for PSD modeling and the impacts for CO, NO_x and SO_2 are below the SILs for state NAAQS analysis. A Modeling and Effects Review Applicability (MERA) evaluation is also been conducted for all air toxics to demonstrate that the proposed project is not expected to adversely affect human health and welfare. A modeling protocol is included as part of this application. The modeling report will be submitted pending approval of the protocol and will be submittal under separate cover. Pursuant to EPA guidance, modeling is not required for GHGs.

10.2. ANALYSIS OF CLASS I AREA IMPACTS

Emissions from the project of NSR-regulated pollutants will have no impact on the nearest Class I area, Big Bend National Park, which is located approximately 900 km from the site.

10.3. ADDITIONAL IMPACTS ANALYSIS

PSD regulations require that three additional impact analyses be performed as part of a PSD permit action -- a visibility analysis, a soil and vegetation analysis, and a growth analysis. Issues concerning impacts on vegetation, soils, and growth due to the proposed modification are addressed below.

1. ***Impairment to visibility, soils, and vegetation***. "The owner or operator shall provide an analysis of the impairment to visibility, soils and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial and other growth associated with the source or modification. The owner or operator need not provide an analysis of the impact on vegetation having no significant commercial or recreational value." 40 C.F.R. § 52.21(o)(1).

   All construction and operation associated with the proposed project will be within the existing facility and will not impact soils or vegetation having any commercial or recreational value. The overall outline of the facility will not change significantly. The emission impacts will be below the respective Significant Impact Level for all criteria pollutants for which there is an increase in allowable emissions due to this project. As such, there is no impact to visibility, soils, or vegetation from this project.

2. ***Growth analysis.*** "The owner or operator shall provide an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the source or modification." 40 C.F.R. § 52.21(o)(2).

   The TPC Houston Plant is an existing facility; therefore, the activities associated with this permitting action are not expected to cause a significant shift of population or an increase in industrial, commercial, and residential growth in the area. Since no significant associated commercial, industrial, or residential growth is expected as a result of this permitting action, negligible growth-related ambient air impacts are expected.

3. ***Visibility monitoring***. "The Administrator may require monitoring of visibility in any Federal class I area near the proposed new stationary source for major modification for such purposes and by such means as the Administrator deems necessary and appropriate." 40 C.F.R. § 52.21(o)(3).

Visibility monitoring is not required for this project because emissions from the project of NSR-regulated pollutants relevant to a visibility analysis will have no impact on the nearest Class I area, Big Bend National Park, which is located approximately 900 km from the site.

11.1. NNSR COMPLIANCE REVIEW

Title 30 TAC § 116.150(d)(2) specifies that all major stationary sources within the state of Texas are in compliance or on a schedule for compliance with all applicable state and federal emission limitations and standards for an NNSR permit to be issued. All Texas facilities owned and operated by TPC meet the compliance review requirements. The signature on the PI-1 form satisfies this compliance certification.

11.2. NNSR OFFSETS

Table 7-1 in Section 7 demonstrates that NNSR is triggered for VOC. 30 TAC § 116.150(d) specifies that project emissions increases (PEI) should be offset with reductions at a ratio of 1.20 to 1. Offsets will be established based on either internal projects, purchasing credits, or a combination thereof.

11.3. ALTERNATIVE SITE ANALYSIS

30 TAC § 116.150(d)(4) specifies that nonattainment permit applications "must contain an analysis of alternative sites, sizes, production processes, and control techniques for the proposed source. The analysis must demonstrate that the benefits of the proposed location and source configuration significantly outweigh the environmental and social costs of that location." The proposed project will generate new jobs and generate additional income in the area. Existing infrastructure at the site will minimize the environmental impacts as compared to building a new facility in another area. Therefore, the benefits of the proposed project significantly outweigh the environmental and social costs associated with its location. TCEQ Table 6N, Alternate Site Analysis for Texas Nonattainment New Source Review and Table 9N Signature Verification, are attached in Appendix B. Additionally, as required by Table 9N, Table 4N Initial Lowest Achievable Emission Rate (LAER) Determination is included in Appendix B.

12. GENERAL APPLICATION REQUIREMENTS

According to the instructions for filing a Form PI-1 General Application, the permit application must address the General Application requirements, as specified in 30 TAC §116.111. The requirements are listed and addressed in this section.

§116.111. General Application.

In order to be granted a permit, amendment, or special permit amendment, the application must include:

(1) a completed Form PI-1 General Application signed by an authorized representative of the applicant. All additional support information specified on the form must be provided before the application is complete;

A signed Form PI-1 is included in Section 2 of this application. Additional supporting information, as specified on the application form, is included in various other sections of this application.

(2) information which demonstrates that all of the following are met.
(2)(A) Protection of public health and welfare.
(2)(A)(i) The emissions from the proposed facility will comply with all rules and regulations of the commission and with the intent of the TCAA, including protection of the health and physical property of the people.

Operations at TPC are consistent with the goal of protecting the public health, welfare, and physical property of the people. This is demonstrated by the facility's compliance with all applicable air quality rules in the Texas Administrative Code, as outlined below.

Chapter 101 – General Rules:
TPC will be operated in accordance with all applicable requirements in Chapter 101. Specifically, TPC will be operated in accordance with the Chapter 101 General Rules relating to circumvention, nuisance, traffic hazard, notification and recordkeeping requirements for emission events and for startup/shutdown/maintenance, sampling and sampling port procedures, emissions inventory requirements, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Ambient Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

Chapter 111 – Control of Air Pollution from Visible Emissions and Particulate Matter:
TPC will comply with all applicable requirements in Chapter 111, including the allowable visible emission requirements in 30 TAC §111.111 and the particulate matter (PM) emission rate specified in 30 TAC §111.151. Also, TPC will comply with the outdoor burning restrictions in 30 TAC §111.201.

Chapter 112 – Control of Air Pollution from Sulfur Compounds:
The proposed facility will comply with all applicable emission limitations, allowable emission rates, monitoring, reporting, and recordkeeping requirements of 30 TAC Chapter 112. The sulfuric acid net ground level in 30 TAC § 112.41(b) does not apply to the proposed project because the Houston Plant is not a sulfuric acid facility or oleum facility. Furthermore, the Houston Plant is not a Kraft Pulp Mill therefore the requirements of 30 TAC Chapter 112 Subchapter D do not apply.

Chapter 113 – Control of Air Pollution from Toxic Materials:
Chapter 113 regulates the emission of radionuclides (40 CFR Part 61, Subpart R), municipal solid waste landfills, hospital/medical/infectious waste incinerators, and hazardous air pollutants for source categories (40 CFR Part 63). There will be no emissions of radionuclides. The Houston Plant is not a

municipal solid waste landfill and does not have a hospital/medical/infectious waste incinerator. Therefore, these sections of the regulation do not apply.

Chapter 114 – Control of Air Pollution from Motor Vehicles:
The proposed sources requested to be authorized by TPC in this application are not subject to any of the requirements of Chapter 114. However, all motor vehicles owned or operated by TPC will comply with the applicable provisions of this regulation.

Chapter 115 – Control of Air Pollution from Volatile Organic Compounds (VOC):
The Houston Plant is located in Harris County, which is a county or area regulated under Chapter 115. Therefore, TPC will comply with the applicable provisions of this regulation.

Chapter 117 – Control of Air Pollution from Nitrogen Compounds:
The Houston Plant is located in Harris County, which is a county or area regulated under Chapter 117. Therefore, TPC will comply with the applicable provisions of this regulation.

Chapter 118 – Control of Air Pollution Episodes:
The Houston Plant is located in Harris County, which is a designated county under 30 TAC §118.5; therefore, TPC will comply with the applicable provisions of this regulation.

Chapter 122 – Federal Operating Permits:
The Houston Plant is a major source of regulated pollutants as defined in 30 TAC Chapter 122. TPC will update federal operating permit (FOP) O1598 to meet the requirements as defined in 30 TAC Chapter 122.

(2)(A)(ii) For issuance of a permit for construction or modification of any facility within 3,000 feet of an elementary, junior high/middle, or senior high school, the commission shall consider any possible adverse short-term or long-term side effects that an air contaminant or nuisance odor from the facility may have on the individuals attending the school(s).

There are schools located within 3,000 feet of the facility. The emissions associated with the facility will comply with all applicable air quality rules and regulations and with the intent of the TCAA, including protection of the health and the physical property of the people.

(2)(B) Measurement of emissions. The proposed facility will have provisions for measuring the emission of significant air contaminants as determined by the executive director. This may include the installation of sampling ports on exhaust stacks and construction of sampling platforms in accordance with guidelines in the "Texas Natural Resource Conservation Commission (TNRCC) Sampling Procedures Manual."

Emissions from any source addressed in the application will be sampled upon request of the Executive Director of the TCEQ, and sampling ports and sampling platforms will be installed as needed.

(2)(C) Best available control technology (BACT). The proposed facility will utilize BACT, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.

The BACT and LAER requirements are addressed in Sections 8 and 9 of this application.

(2)(D) New Source Performance Standards (NSPS). The emissions from the proposed facility will meet the requirements of any applicable NSPS as listed under Title 40 Code of Federal Regulations (CFR) Part 60, promulgated by the EPA under FCAA, §111, as amended.

TPC will comply with all applicable New Source Performance Standards (NSPS).

(2)(E) National Emission Standards for Hazardous Air Pollutants (NESHAP). The emissions from the proposed facility will meet the requirements of any applicable NESHAP, as listed under 40 CFR Part 61, promulgated by EPA under FCAA, §112, as amended.

TPC will comply with all applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) Standards.

(2)(F) NESHAP for source categories. The emissions from the proposed facility will meet the requirements of any applicable maximum achievable control technology standard as listed under 40 CFR Part 63, promulgated by the EPA under FCAA, §112 or as listed under Chapter 113, Subchapter C of this title (relating to National Emissions Standards for Hazardous Air Pollutants for Source Categories (FCAA §112, 40 CFR 63)).

TPC will comply with all applicable NESHAP standards for source categories.

(2)(G) Performance demonstration. The proposed facility will achieve the performance specified in the permit application. The applicant may be required to submit additional engineering data after a permit has been issued in order to demonstrate further that the proposed facility will achieve the performance specified in the permit application. In addition, dispersion modeling, monitoring, or stack testing may be required.

TPC will achieve the performance represented in this permit application. Information submitted, as applicable, to support this demonstration has been included or will include design criteria such as process flow diagrams, material balances, emissions calculations, vendor data on pollution control equipment, control efficiencies, and/or test data from similar facilities.

(2)(H) Nonattainment review. If the proposed facility is located in a nonattainment area, it shall comply with all applicable requirements in this chapter concerning nonattainment review.

The Houston Plant is located in Harris County, which is nonattainment for ozone and attainment for all other FNSR pollutants. The Houston Plant is considered a major source under the NNSR program (for NO_X and VOC). Accordingly for this project, the Houston Plant is subject to the relevant Chapter 116 requirements that require NNSR analyses for NO_X and VOC. A detailed examination of NNSR applicability for the proposed project is provided in Section 7.

(2)(I) Prevention of Significant Deterioration (PSD) review. If the proposed facility is located in an attainment area, it shall comply with all applicable requirements in this chapter concerning PSD review.

The Houston Plant is considered a major source under both the NNSR program (for NO_X and VOC) and PSD program (for other FNSR pollutants). Accordingly for this project, the Houston Plant is subject to the relevant Chapter 116 requirements that require PSD analyses for CO, SO_2, PM, PM_{10}, and $PM_{2.5}$. A detailed examination of PSD applicability for the proposed project is provided in Section 7.

(2)(J) Air dispersion modeling. Computerized air dispersion modeling may be required by the executive director to determine air quality impacts from a proposed new facility or source modification.

TPC will provide air dispersion modeling analysis under a separate cover as part of this permit amendment application.

(2)(K) Hazardous air pollutants. Affected sources (as defined in §116.15(1) of this title (relating to Section 112(g) Definitions)) for hazardous air pollutants shall comply with all applicable requirements under Subchapter C of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources (FCAA, §112(g), 40 CFR Part 63)).

This regulation does not apply because the represented emissions do not constitute construction or reconstruction of a major new source of Hazardous Air Pollutants as defined in the Federal Clean Air Act (FCAA) §112(b).

(2)(L) Mass cap and trade allowances: If subject to Chapter 101, Subchapter H, Division 3, of this title (relating to Mass Emissions Cap and Trade Program), the proposed facility, group of facilities, or account must obtain allowances to operate.

This facility is subject to the mass cap and trading program of 30 TAC Chapter 101, Subchapter H, Division 3. TPC will comply with the Mass Emissions Cap and Trade (MECT) program requirements.

13. PERMIT FEE AND PROFESSIONAL ENGINEER CERTIFICATION

Pursuant to Title 30 of the Texas Administrative Code (30 TAC) Section (§)116.141, the permit fee for a construction permit application is based on the capital cost of the proposed project. The permit fee is determined as 1.0% of the capital cost (for PSD Permit Applications) of the proposed project with a minimum fee of $900 and a maximum fee of $75,000.

The associated capital costs with this project are estimated to be greater than $7.5 million; therefore, the maximum fee of $75,000 will be paid. A summary of project fees is included in the Form PI-1 General Application. Additionally, TPC is requesting to expedite the permit amendment application process; therefore, the APD-EXP form is included at the end of this section. Since the application is a Federal NSR permit, an expedited permitting fee of $20,000 will be paid, with a copy of the surcharge payment form (APD-APS) enclosed with this submittal, Accordingly, TPC has submitted two checks totaling $95,000 (permit fee plus the expedited fee) to the TCEQ Revenue Section under separate cover. A copy of these checks is included in this section for reference purposes only.

Since the capital cost of the project will be more than $2,000,000, a Professional Engineer (P.E.) review has been conducted on the emission estimates and BACT analysis. The P.E. seal is included at the end of this section.

I directly supervised the engineering work products contained in the Emissions Calculations (Section 6, Appendix A) and the LAER/BACT (Sections 8 and 9, respectively).

To the best of my knowledge, the representations made in this document are true and accurate. By affixing my seal below, I submit that the engineering work and calculations performed in the above listed sections were either performed by myself or under my direct supervision, as defined in Section 131.18 of the Texas Engineering Practice Act and incompliance with Title 30 of the Texas Administrative Code, Chapter 116, Section 16.110(f).

2/26/20

Signature *Date*

Adam Mielnicki	Managing Consultant	Trinity Consultants, Inc. Firm ID 5764
Name	*Title*	*Affiliation*

Texas Commission on Environmental Quality

Form APD-APS Air Permitting Surcharge Payment

I. Contact Information	
Company or Other Legal Customer Name: TPC Group LLC	
Customer Reference Number (CN): CN603624289	
Regulated Entity Number (RN): RN100219526	
Company Official or Technical Contact Information: (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Other:_____)	
Name: Jason Sanders	
Title: EHSS Environmental Manager	
Mailing Address: 8600 Park Place Blvd	
City: Houston	
State: TX	
ZIP Code: 77017	
Telephone Number: 713-475-7409	
E-mail Address: Jason.Sanders2@tpcgrp.com	
II. Project Information	
Facility Name: Houston Plant	
Permit Number: 46307	
Project Number:	
III. Surcharge Payment	
Project Type: Federal NSR	
Fee Amount: $20,000	
Check, Money Order, Transaction Number, and/or ePay Voucher Number: *(below)*	
89975	
Paid Online:	☐ YES ☒ NO
Company Name on Check: TPC Group LLC	

Form APD-EXP Expedited Permitting Request

I. Contact Information	
Company or Other Legal Customer Name: TPC Group LLC	
Customer Reference Number (CN): CN603624289	
Regulated Entity Number (RN): RN100219526	
Company Official or Technical Contact Name: Mr. Michael Bankston	
Phone Number: 713-475-7709	
Email: michael.bankston@tpcgrp.com	
II. Project Information	
Facility Type: Petrochemical Manufacturing Facility	
Permit Number: 46307	
Project Number:	
III. Economic Justification	
The purpose of the application associated with this request to expedite will benefit the economy of this state or an area of this state.	☒ YES ☐ NO
IV. Delinquent Fees and Penalties	
Applications will not be expedited if any delinquent fees and/or penalties are owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.	
V. Signature	
The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. As the applicant, I commit to fulfilling all expectations of the expedited permitting program and application requirements promptly. Failure to meet any expectation or requirement may cause my application to be removed from the expedited permitting program and possibly voided at the discretion of the TCEQ Executive Director. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.	
Name:	
Signature:	
Date:	

Reset Form

Check Date: 25-FEB-2020 No. **89976**

Vendor No.: 911 Vendor Name: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
CHECK REQUEST 02.13.20	13-FEB-2020	URGENT CHECK REQUEST: HNO PE	0.00	75,000.00
			0.00	**75,000.00**

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

TPC Group

P.O. Box 1422
Houston, TX 77251
(713) 627-7474

Bank of America
Chicago, Illinois 60603

70-2328 / 719 IL

DATE	CHECK NO.	AMOUNT
25-Feb-2020	89976	$75,000.00

PAY Seventy-Five Thousand Dollars And Zero Cents*****

VOID AFTER 90 DAYS

TO THE ORDER OF
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. Box 13089
HOUSTON-AIR EMISSION
Autin, TX 78711

AUTHORIZED SIGNATURE(S)

⑈089976⑈ ⑆071923284⑆ 5590095252⑈

Check Date: 25-FEB-2020 No. **89975**

Vendor No.: 911 Vendor Name: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

INVOICE NO.	INVOICE DATE	DESCRIPTION	DISCOUNT AMOUNT	NET AMOUNT
CHECK REQUEST 02.13.20	13-FEB-2020	HNO PERMIT EXPEDITING FEES	0.00	20,000.00
			0.00	**20,000.00**

PLEASE DETACH AND RETAIN THIS STATEMENT AS YOUR RECORD OF PAYMENT. *Thank You*

TPC Group

P.O. Box 1422
Houston, TX 77251
(713) 627-7474

Bank of America
Chicago, Illinois 60603

70-2328 / 719 IL

DATE	CHECK NO.	AMOUNT
25-Feb-2020	89975	$20,000.00

PAY Twenty Thousand Dollars And Zero Cents*****

VOID AFTER 90 DAYS

TO THE ORDER OF

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. Box 13088
Austin, Tx 78711-3088

AUTHORIZED SIGNATURE(S)

⑈089975⑈ ⑆071923284⑆ 5590095252⑈

APPENDIX A: EMISSION CALCULATIONS

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Wastewater Treatment Plant
Wastewater Emissions Summary

WWTP Emissions (Minus API Separator)[1,2]

EPN: WW-PN	Permitted		Scenario A		Scenario B		Scenario C		Scenario D		Scenario E		Maximum Emissions[3]	
	Originally Permitted Routine Scenario (All Units are in Operation)		Routine Scenario (All Units are in Operation)		2 Ponds in Operation (NAP/SAP) and 1 Clarifier (SC) in Operation		2 Ponds in Operation (NAP/MAP) and 1 Clarifier (SC) in Operation		1 Pond in Operation (SAP) and 1 Clarifier (SC) in Operation		1 Pond in Operation (NAP) and 1 Clarifier (SC) in Operation			
Chemical Compound	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Isobutylene	0.24	1.03	0.17	0.08	0.16	0.07	0.24	0.11	0.20	0.05	0.20	0.09	0.24	0.11
Isobutane	0.21	0.92	0.13	0.09	0.12	0.08	0.20	0.13	0.16	0.05	0.16	0.10	0.20	0.13
Methanol	0.02	0.10	0.42	0.31	0.37	0.27	0.80	0.58	0.53	0.16	0.53	0.39	0.80	0.58
Styrene	--	--	2.13	0.46	2.05	0.44	2.45	0.53	2.29	0.38	2.29	0.49	2.45	0.53
Trimethylamine	3.80E-03	0.02	0.17	0.11	0.15	0.10	0.30	0.20	0.21	0.06	0.21	0.14	0.30	0.20
Acetone	1.06E-04	4.64E-04	0.03	0.02	0.03	0.02	0.06	0.04	0.04	9.91E-03	0.04	0.02	0.06	0.04
Ethanol	2.20E-04	9.64E-04	1.58	0.65	1.39	0.57	2.94	1.22	1.98	0.33	1.98	0.81	2.94	1.22
Butanol,tert-	2.09E-04	9.15E-04	1.76	1.04	1.54	0.91	3.22	1.92	2.19	0.53	2.19	1.29	3.22	1.92
Methyl-Tertiary-Butyl Ether	2.87E-03	0.01	0.64	0.38	0.58	0.34	0.99	0.60	0.77	0.22	0.77	0.46	0.99	0.60
Butanol,sec-	1.12E-03	4.91E-03	0.11	0.27	0.10	0.24	0.19	0.47	0.14	0.14	0.14	0.33	0.19	0.47
Furfural(1)	0.27	1.16	0.92	0.27	0.81	0.24	1.73	0.51	1.16	0.14	1.16	0.34	1.73	0.51
Butadiene-(1,3)	4.94E-03	0.02	0.19	0.06	0.17	0.06	0.27	0.09	0.22	0.04	0.22	0.07	0.27	0.09
octadiene	1.09E-03	4.77E-03	0.30	0.08	0.26	0.07	0.56	0.15	0.37	0.04	0.37	0.10	0.56	0.15
Totals	**0.75**	**3.28**	**8.56**	**3.81**	**7.72**	**3.40**	**13.95**	**6.54**	**10.25**	**2.17**	**10.25**	**4.63**	**13.95**	**6.54**
MAERT Value	**0.75**	**3.27**												
Proposed PTE	**13.95**	**6.54**												

[1] Emissions modeled using Toxchem Version 4.4.
[2] NAP = North Aeration Pond, MAP = Middle Aeration Pond, SAP = South Aeration Pond, NC = North Clarifier, and SC = South Clarifier.
[3] Maximum VOC emissions for WW-PN are based on Scenario C.

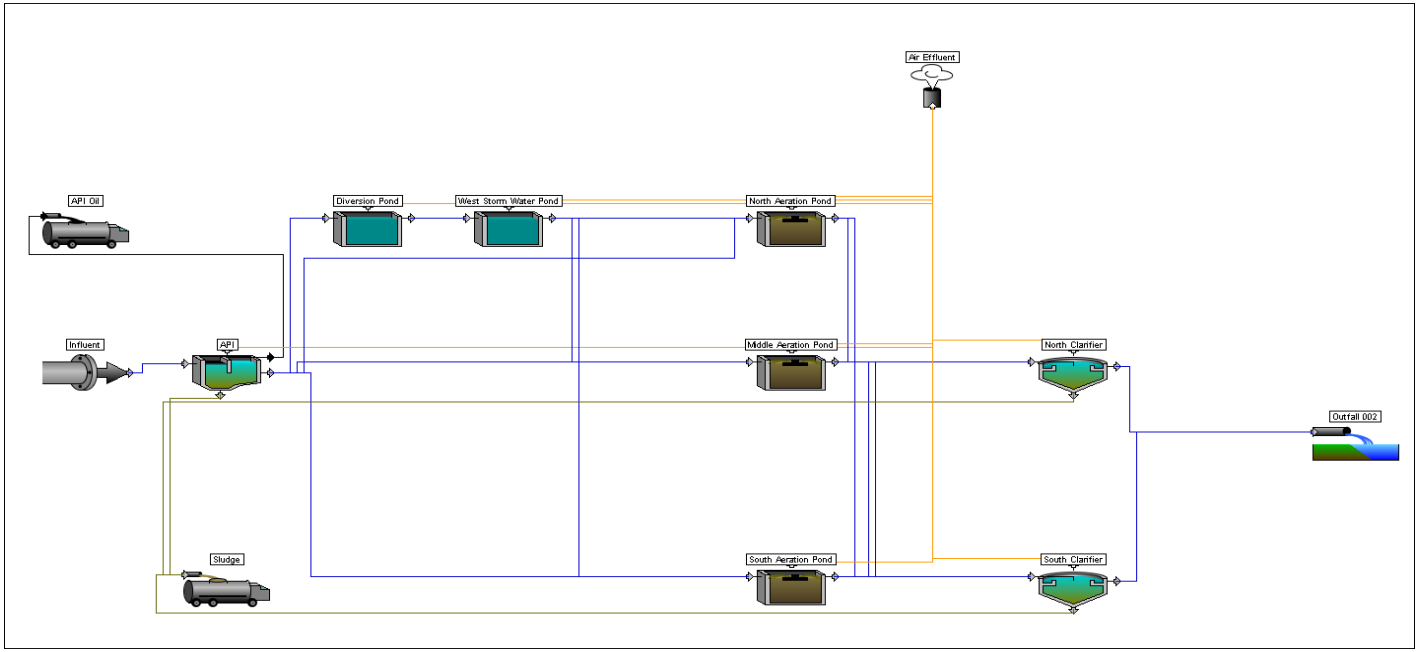
API Separator Emissions[1,2]

EPN: F-10A	Permitted		Scenario A		Scenario B		Scenario C		Scenario D		Scenario E		Maximum Emissions[3]	
	Originally Permitted Routine Scenario (All Units are in Operation)		Routine Scenario (All Units are in Operation)		2 Ponds in Operation (NAP/SAP) and 1 Clarifier (SC) in Operation		2 Ponds in Operation (NAP/MAP) and 1 Clarifier (SC) in Operation		1 Pond in Operation (SAP) and 1 Clarifier (SC) in Operation		1 Pond in Operation (NAP) and 1 Clarifier (SC) in Operation			
Chemical Compound	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
Isobutylene	0.03	0.13	0.04	4.24E-03	0.04	4.24E-03	0.04	4.24E-03	0.04	4.24E-03	0.04	4.24E-03	0.04	4.24E-03
Isobutane	0.03	0.12	0.03	5.69E-03	0.03	5.69E-03	0.03	5.69E-03	0.03	5.69E-03	0.03	5.69E-03	0.03	5.69E-03
Methanol	0.10	0.44	2.10	0.49	2.10	0.49	2.10	0.49	2.10	0.49	2.10	0.49	2.10	0.49
Styrene	--	--	0.20	0.01	0.20	0.01	0.20	0.01	0.20	0.01	0.20	0.01	0.20	0.01
Trimethylamine	7.39E-03	0.03	0.01	2.68E-03	0.01	2.68E-03	0.01	2.68E-03	0.01	2.68E-03	0.01	2.68E-03	0.01	2.68E-03
Acetone	1.81E-04	7.91E-04	0.07	0.01	0.07	0.01	0.07	0.01	0.07	0.01	0.07	0.01	0.07	0.01
Ethanol	1.58E-04	6.90E-04	1.26	0.16	1.26	0.16	1.26	0.16	1.26	0.16	1.26	0.16	1.26	0.16
Butanol,tert-	1.92E-05	8.40E-05	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03
Methyl-Tertiary-Butyl Ether	4.84E-04	2.12E-03	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03	0.17	0.03
Butanol,sec-	8.34E-05	3.65E-04	0.01	7.20E-03	0.01	7.20E-03	0.01	7.20E-03	0.01	7.20E-03	0.01	7.20E-03	0.01	7.20E-03
Furfural(1)	0.06	0.25	0.41	0.04	0.41	0.04	0.41	0.04	0.41	0.04	0.41	0.04	0.41	0.04
Butadiene-(1,3)	6.91E-04	3.03E-03	0.04	3.92E-03	0.04	3.92E-03	0.04	3.92E-03	0.04	3.92E-03	0.04	3.92E-03	0.04	3.92E-03
octadiene	3.78E-04	1.66E-03	0.04	2.54E-03	0.04	2.54E-03	0.04	2.54E-03	0.04	2.54E-03	0.04	2.54E-03	0.04	2.54E-03
Totals	**0.22**	**0.98**	**4.57**	**0.80**	**4.57**	**0.80**	**4.57**	**0.80**	**4.57**	**0.80**	**4.57**	**0.80**	**4.57**	**0.80**
MAERT Value	**0.27**	**1.18**												
Proposed PTE	**4.57**	**0.80**												

[1] Emissions modeled using Toxchem Version 4.4.
[2] NAP = North Aeration Pond, MAP = Middle Aeration Pond, SAP = South Aeration Pond, NC = North Clarifier, and SC = South Clarifier.
[3] Note that VOC emissions for F-10A remain the same (regardless of operating scenario) because there is no change to the operating parameters/representations for the oil-water separator across different operating scenarios.

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Wastewater Treatment Plant
Toxchem Model and Inputs

Toxchem Model Overview



Modeled Sources - Routine Operation[1,2]

Modeled Sources	Toxchem Unit
API Separator	API Separator
North Aeration Pond (NAP)	Activated Sludge - Mechanical Aeration
Middle Aeration Pond (MAP)	Activated Sludge - Mechanical Aeration
South Aeration Pond (SAP)	Activated Sludge - Mechanical Aeration
North Clarifier (NC)	Primary Clarifier
South Clarifier (SC)	Primary Clarifier

[1] Routine wastewater sources as modeled in Toxchem. The Diversion Pond and West Storm Water Pond are not considered to be part of routine operations (used in upset events only).
[2] The following modeled sources are effluent streams that require no Toxchem inputs: API Oil, Sludge, Air Effluent, and Outfall 002.

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Wastewater Treatment Plant
Toxchem Model and Inputs

Toxchem Unit Parameters

API Separator			
Parameter	**Value**	**Unit**	**Comment**
Liquid Depth	15.0	**ft**	
Surface Area	1000.0	**sqft**	
Weir Length	16.4	**ft**	
Waterfall Height	0.33	**ft**	
SS Removal Efficiency	0.0	**%**	Process Knowledge
Oil Removal Efficiency	80.0	**%**	Toxchem Default
Sludge SS Concentration	10000.0	**mg/L**	Toxchem Default
Flow Rate of Recovered Oil Stream	50.0	**gpd(US)**	Process Knowledge
Covered	No	--	

Diversion Pond			
Parameter	**Value**	**Unit**	**Comment**
Liquid Depth	10.0	**ft**	
Surface Area	27000.0	**sqft**	
Covered	No	--	

West Storm Water Pond			
Parameter	**Value**	**Unit**	**Comment**
Liquid Depth	10.0	**ft**	
Surface Area	59500.0	**sqft**	
Covered	No	--	

North Aeration Pond			
Parameter	**Value**	**Unit**	**Comment**
Depth	10.0	**ft**	
Surface Area	75600.0	**sqft**	
Number of CSTRs	4.0		
SRT	10.0	**d**	Toxchem Default
MLSS	2000.0	**mg/L**	Process Knowledge
VSS to SS Ratio	50.0	**%**	Process Knowledge
Total Aerator Power	400.0	**lbO2/((HP*h)**	Process Knowledge
Standard Oxygen Transfer Rate	2.9587		Toxchem Default
Dirty/Clean Water Correction Factor	0.6	**%**	Toxchem Default
Covered	No		

Middle Aeration Pond			
Parameter	**Value**	**Unit**	**Comment**
Depth	10	**ft**	
Surface Area	75,600	**sqft**	
Number of CSTRs	4		
SRT	10	**d**	Toxchem Default
MLSS	2000.0	**mg/L**	Process Knowledge
VSS to SS Ratio	50.0	**%**	Process Knowledge
Total Aerator Power	400	**lbO2/((HP*h)**	Process Knowledge
Standard Oxygen Transfer Rate	2.9587		Toxchem Default
Dirty/Clean Water Correction Factor	0.6	**%**	Toxchem Default
Covered	No		

South Aeration Pond			
Parameter	**Value**	**Unit**	**Comment**
Depth	15	**ft**	
Surface Area	60,620	**sqft**	
Number of CSTRs	4		
SRT	10	**d**	Toxchem Default
MLSS	4000.0	**mg/L**	Process Knowledge
VSS to SS Ratio	50.0	**%**	Process Knowledge
Total Aerator Power	400	**HP**	Process Knowledge
Standard Oxygen Transfer Rate	2.9587	**lbO2/((HP*h)**	Toxchem Default
Dirty/Clean Water Correction Factor	0.6	**%**	Toxchem Default
Covered	No		

North Clarifier			
Parameter	**Value**	**Unit**	**Comment**
Depth	10	**ft**	
Surface Area	3,848	**sqft**	
Weir Length	51.54	**ft**	
Waterfall Height	0.66	**ft**	
Effluent SS Concentration	80	**mg/L**	Toxchem Default
Sludge SS Concentration	30000	**mg/L**	Toxchem Default
Oil Removal Efficiency	100	**%**	Toxchem Default
Covered	No		

South Clarifier			
Parameter	**Value**	**Unit**	**Comment**
Depth	10	**ft**	
Surface Area	3,848	**sqft**	
Weir Length	10.84	**ft**	
Waterfall Height	0.66	**ft**	
Effluent SS Concentration	80	**mg/L**	Toxchem Default
Sludge SS Concentration	30000	**mg/L**	Toxchem Default
Oil Removal Efficiency	100	**%**	Toxchem Default
Covered	No		

Site Parameters

Parameter	Value	Unit	Reference
Elevation	25	ft	Site Knowledge
Wind Speed - Short-Term	21.8	mph	Maximum Wind Speed in 2018
Wind Speed - Long-Term	6.2	mph	Average Wind Speed in 2018
Sitewide pH	8.3	--	Site Knowledge

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Wastewater Treatment Plant
Wastewater Operating Parameters

Proposed Wastewater Influent Stream Parameters[1,2]

Parameter	Units	Proposed Hourly	Proposed Annual	Comments
Flow Rate	**gpm(US)**	1400.0	1400.0	Process Knowledge
Suspended Solids	**mg/L**	250.0	250.0	Process Knowledge
VSS to SS Ratio	**%**	50.0	50.0	Process Knowledge
Wastewater DOC	**mg/L**	0.0	0.0	Toxchem Default
Oil/Grease Concentration	**mg/L**	0.0	0.0	Toxchem Default
Temperature	**deg F**	99.0	70.8	Wind Speed Based on Met Data from Houston Milby Park Monitor (EPA Site: 48-201-0069)
Chemical Concentrations				
Isobutylene	**mg/L**	0.66	0.06	Process Knowledge
Isobutane	**mg/L**	0.68	0.09	Process Knowledge
Methanol	**mg/L**	313.67	109.62	Process Knowledge
Acetone	**mg/L**	3.23	0.83	Process Knowledge
Ethanol	**mg/L**	189.82	36.98	Process Knowledge
Butanol,tert-	**mg/L**	85.03	23.37	Process Knowledge
Methyl-Tertiary-Butyl Ether	**mg/L**	3.58	0.57	Process Knowledge
Butanol,sec-	**mg/L**	1.14	1.14	Process Knowledge
Furfural	**mg/L**	211.20	28.91	Process Knowledge
Butadiene-(1,3)	**mg/L**	0.73	0.05	Process Knowledge
Octadiene	**mg/L**	194.70	11.60	Process Knowledge
Styrene	**mg/L**	4.32	0.20	Process Knowledge
Trimethylamine	**mg/L**	6.60	1.15	Process Knowledge

[1] The proposed hourly and annual concentrations for the individual wastewater contaminants are based on the observed maximum and average concentrations for each contaminant in 2018. A 10% "adjustment factor" has been applied to the observed maxiumum and average concentrations to account for variability in sample concentrations. The concentration of methanol and ethanol has been further adjusted to account for additional wastewater streams from this project which are expected to contain trace amounts of methanol and ethanol.

[2] The proposed maxium annual flow rate is equivalent to the proposed maximum hourly flow rate.

Proposed MLSS and VSS to SS Ratio for the North/Middle/South Aeration Ponds[1]

Parameter	North Aeration Pond	Middle Aeration Pond	South Aeration Pond
MLSS (mg/L)	2000	2000	4000
VSS to SS Ratio	50%	50%	50%

[1] The proposed MLSS (mg/L) and VSS to SS ratio for North, Middle, and South Aeration Ponds, modeled as "activated sludge - mechanical aeration", on both an hourly average and annual average basis.

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Hourly Fixed Roof Tank Calculations
EPN T-81 / FIN T-81
EPN T-82 / FIN T-82
EPN T-86 / FIN T-86

Hourly Fixed Roof Emissions[1]

FIN	EPN	Tank Type	Chemical	Maximum Liquid Bulk Temperature	Maximum Liquid Surface Temperature[2]	Vapor Pressure at Maximum Liquid Surface Temp, P_{VA}[3]	Vapor Molecular Weight, M_V[4]	Maximum Filling Rate (FR_M, gal/hr)	VOC Vapor Weight Fraction[5]	Maximum Short Term Emission Rate, L_{MAX}[6]
				(°F)	(°R)	(psia)	(lb/lb-mole)	(gal/hr)		(lb/hr)
T-81	T-81	Vertical Fixed Roof	Furfural/Water	160.00	165.90	5.23	19.83	8,400	0.024	0.41
T-82	T-82	Vertical Fixed Roof	Dimethyl Formamide	130.00	135.90	0.43	73.09	8,400	1.000	5.54
T-86	T-86	Vertical Fixed Roof	Furfural/Water	140.00	145.90	3.22	19.65	8,400	0.022	0.24

[1]TCEQ Guidance Document, *Estimating Short Term Emission Rates from Fixed Roof Tanks,* (APDG 6250v1, Revised 02/18)
[2]Per AP-42 Figure 7.1-17, estimated daily maximum liquid surface temperature based on the worst-case liquid bulk temperature
[3]Worst-case vapor pressure at the maximum liquid surface temperature
[4]For furfural-water mixture (20:80 w/w), vapor molecular weight at the maximum liquid bulk temperature
[5]VOC vapor weight fraction at maximum liquid surface temperature
[6]Reference 1, Equation 1

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Hourly Internal Floating Roof Tank Calculations
EPN TK-2D6/ FIN TK-2D6

Hourly Floating Roof Emissions[1]

FIN	EPN	Tank Type	Chemical	Average Liquid Surface Temp.	Maximum Liquid Surface Temp.[2]	Vapor Pressure at Average Liquid Surface Temp.	Vapor Pressure at Maximum Liquid Surface Temp.	Vapor Pressure Function, P*	Vapor Pressure Function, P^*_{MAX}	Maximum Hourly Pump Rate, PR_M	Maximum Hourly Pump Rate, Q_{MAX}	Shell Clingage Factor, C_S	Liquid Density, W_L	Tank Diameter, D
				(°F)	(°R)	(psia)	(psia)			(gal/hr)	(bbl/yr)		(lb/gal)	(ft)
TK-2D6	TK-2D6	Floating Roof	MTBE	68.25	95.00	3.975	7.208	0.079	0.167	22,000	4,588,571	0.0015	6.18	75

[1]TCEQ Guidance Document, *Short Term Emissions from Floating Roof Storage Tanks,* (APDG 6419v1, Released 02/18)

[2]Per TCEQ Guidance, the maximum liquid surface temperature is 95F

[3]Standing losses are adjusted for temperature by scaling emissions using the ratio between the vapor pressure function at the maximum liquid surface temperature and the vapor pressure function at the average liquid surface te

[4]Per TCEQ Guidance, the monthly withdrawal and standing losses are scaled and averaged to obtain total losses in (lb/hr): [$L_{Standing}$ (lb/mo) + $L_{Withdrawal}$ (lb/mo)]*[12 mo/8760 hours]

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Hourly Internal Floating Roof Tank Calculations
EPN TK-2D6/ FIN TK-2D6

Hourly Floating Roof Emissions[1]

FIN	EPN	Tank Type	Chemical	Effective Column Diameter, F_C	Number of Fixed Roof Columns, N_C	Withdrawal Losses, L_{WD}	Rim Seal Losses, L_R[3]	Deck Fitting Losses, L_F[3]	Deck Seam Losses, L_D[3]	VOC Vapor Weight Fraction	Total Losses, L_T[4]
				(ft)	(ft)	(lb/mo)	(lb/mo)	(lb/mo)	(lb/mo)		(lb/hr)
TK-2D6	TK-2D6	Floating Roof	MTBE	0	0	44.54	202.27	143.43	0.00	1.00	0.535

[1]TCEQ Guidance Document, *Short Term Emissions from*
[2]Per TCEQ Guidance, the maximum liquid surface temp
[3]Standing losses are adjusted for temperature by scalin emperature
[4]Per TCEQ Guidance, the monthly withdrawal and stan

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Annual Fixed Roof Tank Calculations
EPN T-81/ FIN T-81

Annual Fixed-Roof Tank Emissions
Constant-Level Tank

Variable	Input Data
Tank Identification	Tank 81
FIN	T-81
EPN	T-81
Discharging to	Atmosphere
Location for Calculation Purposes	Houston, Texas
Tank/Roof Type	Cone
Underground?	Aboveground
Diameter, ft	30.0
Shell Height or Length, ft	24.0
Maximum Liquid Height, ft	21.0
Nominal Tank Capacity, gal	111,053
Shell Paint Color	White
Shell Paint Condition	Good
Roof Paint Color	White
Roof Paint Condition	Good
Throughput, gallons/year	315,390,520

Monthly Emissions Calculations[3,4]

Month	January	February	March	April	May	June	July	August	September	October	November	December
Type of Substance	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid
Tank Contents	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water
Throughput, gallons/month	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543	26,282,543
Average Change in Liquid Height, ft	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Adjusted Throughput, gallons/month	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659	5,005,659
Effective Diameter, ft	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Working Capacity, gal	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053
Average Liquid Height, ft	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Cone Tank Roof Slope, ft/ft	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Dome Tank Roof Radius, ft	--	--	--	--	--	--	--	--	--	--	--	--
Dome Tank Roof Height, ft	--	--	--	--	--	--	--	--	--	--	--	--
Roof Outage, ft	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125
Vapor Space Outage, ft	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31
Vapor Space Volume, ft^3	8703	8703	8703	8703	8703	8703	8703	8703	8703	8703	8703	8703
Average Daily Minimum Ambient Temperature, F	39.70	42.60	50.00	58.10	64.40	70.60	72.40	72.00	67.90	57.60	49.60	42.20
Average Daily Maximum Ambient Temperature, F	61.00	65.30	71.10	78.40	84.60	90.10	92.70	92.50	88.40	81.60	72.40	64.70
Daily Total Solar Insolation Factor, Btu/ft^2/day	843	1084	1347	1590	1784	1911	1887	1779	1546	1330	973	791
Daily Average Ambient Temperature, F	50.4	54.0	60.6	68.3	74.5	80.4	82.6	82.3	78.2	69.6	61.0	53.5
Tank Paint Solar Absorbance, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Daily Vapor Temperature Range, F	19.4	21.5	21.6	22.2	23.0	23.1	23.6	23.2	22.1	23.6	21.0	20.0
Daily Average Liquid Surf. Temperature, F	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.3
Daily Minimum Liquid Surf. Temperature, F	63.41	62.87	62.85	62.70	62.49	62.47	62.35	62.44	62.72	62.35	62.99	63.3
Daily Maximum Liquid Surf. Temperature, F	73.09	73.63	73.65	73.80	74.01	74.03	74.15	74.06	73.78	74.15	73.51	73.2
Liquid Bulk Temperature	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25
Vapor Molecular Weight, lb/lbmol	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.2774	0.2722	0.2720	0.2706	0.2685	0.2683	0.2672	0.2681	0.2707	0.2672	0.2733	0.2759
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.3870	0.3941	0.3944	0.3964	0.3992	0.3995	0.4011	0.3998	0.3961	0.4011	0.3926	0.3890
Vapor Density, lb/ft^3	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099
Daily Vapor Pressure range, psi	0.110	0.122	0.122	0.126	0.131	0.131	0.134	0.132	0.125	0.134	0.119	0.113
Breather Vent Pressure Setting, psig	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Breather Vent Vacuum Setting, psig	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300
Breather Vent Pressure Setting Range, psi	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Ambient Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Vapor Space Expansion Factor	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04
Vented Vapor Saturation Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Annual Turnovers	540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89
Turnover Factor	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Standing Storage Loss, lb/mo	9.79	9.93	11.05	11.01	11.85	11.52	12.17	11.96	10.97	12.17	10.39	10.13
Working Loss, lb/mo	164.77	164.77	164.77	164.77	164.77	164.77	164.77	164.77	164.77	164.77	164.77	164.77
Total Losses, lb/mo	2.11	2.11	2.12	2.12	2.13	2.13	2.13	2.13	2.12	2.14	2.11	2.11

[3]Based on AP-42, November 2006, Section 7.1.3.1.
[4]Adjusted throughput for constant-level tanks based on EPA guidance: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-chapter-7-tanks-software-frequent-questions#6

Annual Emissions Summary

Standing Storage Loss, lb/yr	**132.96**
Working Loss, lb/yr	**1977.27**
Total Losses, lb/yr	**25.46**

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Annual Fixed Roof Tank Calculations
EPN T-82/ FIN T-82

Annual Fixed-Roof Tank Emissions
Constant-Level Tank

Variable	Input Data
Tank Identification	Tank 82
FIN	T-82
EPN	T-82
Discharging to	Atmosphere
Location for Calculation Purposes	Houston, Texas
Tank/Roof Type	Cone
Underground?	Aboveground
Diameter, ft	30.0
Shell Height or Length, ft	24.0
Maximum Liquid Height, ft	21.0
Nominal Tank Capacity, gal	111,053
Shell Paint Color	White
Shell Paint Condition	Good
Roof Paint Color	White
Roof Paint Condition	Good
Throughput, gallons/year	520,394,358

Monthly Emissions Calculations[1,2]

Month	January	February	March	April	May	June	July	August	September	October	November	December
Type of Substance	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid
Multiple/Single Component	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide	Dimethyl Formamide
Throughput, gallons/month	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197	43,366,197
Average Change in Liquid Height, ft	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Adjusted Throughput, gallons/month	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337	8,259,337
Effective Diameter, ft	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Working Capacity, gal	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053	111,053
Average Liquid Height, ft	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Cone Tank Roof Slope, ft/ft	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Dome Tank Roof Radius, ft	--	--	--	--	--	--	--	--	--	--	--	--
Dome Tank Roof Height, ft	--	--	--	--	--	--	--	--	--	--	--	--
Roof Outage, ft	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125
Vapor Space Outage, ft	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31
Vapor Space Volume, ft^3	8703	8703	8703	8703	8703	8703	8703	8703	8703	8703	8703	8703
Average Daily Minimum Ambient Temperature, F	39.70	42.60	50.00	58.10	64.40	70.60	72.40	72.00	67.90	57.60	49.60	42.20
Average Daily Maximum Ambient Temperature, F	61.00	65.30	71.10	78.40	84.60	90.10	92.70	92.50	88.40	81.60	72.40	64.70
Daily Total Solar Insolation Factor, Btu/ft^2/day	843	1084	1347	1590	1784	1911	1887	1779	1546	1330	973	791
Daily Average Ambient Temperature, F	50.4	54.0	60.6	68.3	74.5	80.4	82.6	82.3	78.2	69.6	61.0	53.5
Tank Paint Solar Absorbance, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Daily Vapor Temperature Range, F	19.4	21.5	21.6	22.2	23.0	23.1	23.6	23.2	22.1	23.6	21.0	20.0
Daily Average Liquid Surf. Temperature, F	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.3
Daily Minimum Liquid Surf. Temperature, F	63.41	62.87	62.85	62.70	62.49	62.47	62.35	62.44	62.72	62.35	62.99	63.3
Daily Maximum Liquid Surf. Temperature, F	73.09	73.63	73.65	73.80	74.01	74.03	74.15	74.06	73.78	74.15	73.51	73.2
Liquid Bulk Temperature	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25
Vapor Molecular Weight, lb/lbmol	73.09	73.09	73.09	73.09	73.09	73.09	73.09	73.09	73.09	73.09	73.09	73.09
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487	0.0487
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.0405	0.0397	0.0396	0.0394	0.0391	0.0391	0.0389	0.0390	0.0394	0.0389	0.0399	0.0403
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.0582	0.0594	0.0594	0.0597	0.0602	0.0602	0.0605	0.0603	0.0597	0.0605	0.0591	0.0585
Vapor Density, lb/ft^3	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628	0.000628
Daily Vapor Pressure range, psi	0.018	0.020	0.020	0.020	0.021	0.021	0.022	0.021	0.020	0.022	0.019	0.018
Breather Vent Pressure Setting, psig	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Breather Vent Vacuum Setting, psig	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Breather Vent Pressure Setting Range, psi	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Ambient Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Vapor Space Expansion Factor	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03
Vented Vapor Saturation Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Annual Turnovers	892.48	892.48	892.48	892.48	892.48	892.48	892.48	892.48	892.48	892.48	892.48	892.48
Turnover Factor	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Standing Storage Loss, lb/mo	5.54	5.63	6.27	6.25	6.73	6.54	6.91	6.79	6.22	6.91	5.89	5.74
Working Loss, lb/mo	140.06	140.06	140.06	140.06	140.06	140.06	140.06	140.06	140.06	140.06	140.06	140.06
Total Losses, lb/mo	145.61	145.70	146.33	146.31	146.79	146.61	146.97	146.85	146.29	146.98	145.96	145.80

[1]Based on AP-42, November 2006, Section 7.1.3.1.
[2]Adjusted throughput for constant-level tanks based on EPA guidance: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-chapter-7-tanks-software-frequent-questions#6

Annual Emissions Summary

Standing Storage Loss, lb/yr	**75.42**
Working Loss, lb/yr	**1680.77**
Total Losses, lb/yr	**1756.20**

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Annual Fixed Roof Tank Calculations
EPN T-86/ FIN T-86

Annual Fixed-Roof Tank Emissions
Constant-Level Tank

Variable	Input Data
Tank Identification	Tank 86
FIN	T-86
EPN	T-86
Discharging to	Atmosphere
Location for Calculation Purposes	Houston, Texas
Tank/Roof Type	Cone
Underground?	Aboveground
Diameter, ft	20.0
Shell Height or Length, ft	27.0
Maximum Liquid Height, ft	24.3
Nominal Tank Capacity, gal	57,113
Shell Paint Color	White
Shell Paint Condition	Good
Roof Paint Color	White
Roof Paint Condition	Good
Throughput, gallons/year	96,920,761

Monthly Emissions Calculations[1,2]

Month	January	February	March	April	May	June	July	August	September	October	November	December
Type of Substance	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid	Organic Liquid
Tank Contents	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water	Furfural/Water
Throughput, gallons/month	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730	8,076,730
Average Change in Liquid Height, ft	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
Adjusted Throughput, gallons/month	2,991,057	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243	2,692,243
Effective Diameter, ft	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Working Capacity, gal	57,113	57,113	57,113	57,113	57,113	57,113	57,113	57,113	57,113	57,113	57,113	57,113
Average Liquid Height, ft	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50
Cone Tank Roof Slope, ft/ft	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625	0.0625
Dome Tank Roof Radius, ft	--	--	--	--	--	--	--	--	--	--	--	--
Dome Tank Roof Height, ft	--	--	--	--	--	--	--	--	--	--	--	--
Roof Outage, ft	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083	0.2083
Vapor Space Outage, ft	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71	13.71
Vapor Space Volume, ft^3	4307	4307	4307	4307	4307	4307	4307	4307	4307	4307	4307	4307
Average Daily Minimum Ambient Temperature, F	39.70	42.60	50.00	58.10	64.40	70.60	72.40	72.00	67.90	57.60	49.60	42.20
Average Daily Maximum Ambient Temperature, F	61.00	65.30	71.10	78.40	84.60	90.10	92.70	92.50	88.40	81.60	72.40	64.70
Daily Total Solar Insolation Factor, Btu/ft^2/day	843	1084	1347	1590	1784	1911	1887	1779	1546	1330	973	791
Daily Average Ambient Temperature, F	50.4	54.0	60.6	68.3	74.5	80.4	82.6	82.3	78.2	69.6	61.0	53.5
Tank Paint Solar Absorbance, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Daily Vapor Temperature Range, F	19.4	21.5	21.6	22.2	23.0	23.1	23.6	23.2	22.1	23.6	21.0	20.0
Daily Average Liquid Surf. Temperature, F	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.3
Daily Minimum Liquid Surf. Temperature, F	63.41	62.87	62.85	62.70	62.49	62.47	62.35	62.44	62.72	62.35	62.99	63.3
Daily Maximum Liquid Surf. Temperature, F	73.09	73.63	73.65	73.80	74.01	74.03	74.15	74.06	73.78	74.15	73.51	73.2
Liquid Bulk Temperature	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25	68.25
Vapor Molecular Weight, lb/lbmol	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96	18.96
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282	0.3282
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.2774	0.2722	0.2720	0.2706	0.2685	0.2683	0.2672	0.2681	0.2707	0.2672	0.2733	0.2759
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.3870	0.3941	0.3944	0.3964	0.3992	0.3995	0.4011	0.3998	0.3961	0.4011	0.3926	0.3890
Vapor Density, lb/ft^3	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099	0.001099
Daily Vapor Pressure range, psi	0.110	0.122	0.122	0.126	0.131	0.131	0.134	0.132	0.125	0.134	0.119	0.113
Breather Vent Pressure Setting, psig	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Breather Vent Vacuum Setting, psig	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300
Breather Vent Pressure Setting Range, psi	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Ambient Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Vapor Space Expansion Factor	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04
Vented Vapor Saturation Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Annual Turnovers	570.90	570.90	570.90	570.90	570.90	570.90	570.90	570.90	570.90	570.90	570.90	570.90
Turnover Factor	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Standing Storage Loss, lb/mo	4.75	4.82	5.36	5.34	5.75	5.59	5.90	5.80	5.32	5.91	5.04	4.92
Working Loss, lb/mo	97.17	87.46	87.46	87.46	87.46	87.46	87.46	87.46	87.46	87.46	87.46	87.46
Total Losses, lb/mo	1.23	1.11	1.12	1.12	1.12	1.12	1.13	1.13	1.12	1.13	1.12	1.11

[1]Based on AP-42, November 2006, Section 7.1.3.1.

[2]Adjusted throughput for constant-level tanks based on EPA guidance: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-chapter-7-tanks-software-frequent-questions#6

Annual Emissions Summary

Standing Storage Loss, lb/yr	**64.50**
Working Loss, lb/yr	**1059.21**
Total Losses, lb/yr	**13.56**

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Annual Internal Floating Roof Tank Calculations
EPN TK-2D6/ FIN TK-2D6

Annual Floating Roof Tank Emissions

Variable	Input Data
Tank Identification	**Tank 2D6**
Location for Calculation Purposes	**Houston, Texas**
Tank Type - Roof Type	**IFR - Self Supporting Roof**
Rim-Seal System (Primary/Secondary)	**Vapor Mounted w/ Rim Mounted Secondary**
Deck Type (IFR Tanks Only)	**Welded**
Deck Construction (IFR w/bolted decks Only)	**N/A**
Type of Substance	**Organic Liquid**
Diameter, ft (D)	**75.0**
Throughput, gallons/year	**130,183,200**
Tank Paint Color	**Aluminum - Specular**
Tank Paint Condition	**Good**
Shell Condition	**Light Rust**

Monthly Emissions Calculations[1]

Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Type of Substance	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**
Multiple/Single Component	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**	**MTBE**
Ideal Gas Constant, psia ft3/lbmole °R (R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Average Daily Minimum Ambient Temperature, F	39.70	42.60	50.00	58.10	64.40	70.60	72.40	72.00	67.90	57.60	49.60	42.20
Average Daily Maximum Ambient Temperature, F	61.00	65.30	71.10	78.40	84.60	90.10	92.70	92.50	88.40	81.60	72.40	64.70
Daily Total Solar Insolation Factor, Btu/ft^2/day (I)	843.30	1084.11	1347.45	1590.47	1784.01	1910.60	1887.12	1778.62	1545.74	1330.31	973.38	790.95
Daily Average Ambient Temperature, F	50.4	54.0	60.6	68.3	74.5	80.4	82.6	82.3	78.2	69.6	61.0	53.5
Tank Paint Solar Absorbance, dimensionless (α)	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390
Daily Vapor Temperature Range, R	24.5	28.2	29.9	32.0	34.0	34.9	35.2	34.2	31.6	31.8	27.0	24.8
Daily Average Liquid Surf. Temperature, F	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Daily Minimum Liquid Surf. Temperature, F	62.1	61.2	60.8	60.3	59.7	59.5	59.4	59.7	60.3	60.3	61.5	62.0
Daily Maximum Liquid Surf. Temperature, F	74.4	75.3	75.7	76.2	76.8	77.0	77.1	76.8	76.2	76.2	75.0	74.5
Liquid Bulk Temperature, F	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Vapor Molecular Weight, lb/lbmol (M_v)	88.15	88.15	88.15	88.15	88.15	88.15	88.15	88.15	88.15	88.15	88.15	88.15
Liquid Density, lb/gal (W_L)	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18	6.18
Liquid Mole Fraction	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Antoine's Coefficient A	7.08	7.08	7.08	7.08	7.08	7.08	7.08	7.08	7.08	7.08	7.08	7.08
Antoine's Coefficient B	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70	1233.70
Antoine's Coefficient C	238.88	238.88	238.88	238.88	238.88	238.88	238.88	238.88	238.88	238.88	238.88	238.88
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752	3.9752
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	3.4343	3.3596	3.3246	3.2829	3.2423	3.2249	3.2186	3.2392	3.2897	3.2864	3.3828	3.4283
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	4.5839	4.6803	4.7265	4.7827	4.8385	4.8626	4.8714	4.8428	4.7733	4.7779	4.6500	4.5916
Daily Vapor Pressure range, psi	1.150	1.321	1.402	1.500	1.596	1.638	1.653	1.604	1.484	1.491	1.267	1.163
Ambient Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Average Ambient wind speed, mph (v)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Product Factor (K_C)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Zero wind speed rim seal loss factor (K_{Ra})	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Wind speed dependent rim seal loss factor (K_{Rb})	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Seal related wind speed exponent (n)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Shell Clingage Factor, bbl/1000 ft^2 (C_S)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Number of Columns (N_C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Effective Column Diameter, ft (F_C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vapor Space Expansion Factor (K_E)	0.1481	0.1709	0.1817	0.1948	0.2076	0.2132	0.2152	0.2086	0.1926	0.1937	0.1638	0.1499
Vented Vapor Saturation Factor (K_S)	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
Vapor Pressure Function (P*)	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864	0.07864
Number of Fittings (NF)												
Access Hatch (24-in. Diam.)-Bolted Cover, Gasketed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Automatic Gauge Float Well-Unbolted Cover, Ungasketed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Column Well (24-in. Diam.)-Built-Up Col.-Sliding Cover, Ungask.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gauge-Hatch/Sample Well (8-in. Diam.)-Slit fabric seal, 10% open area	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Ladder Well (36-in. Diam.)-Sliding Cover, Gasketed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rim Vent (6-in. Diameter)-Weighted Mech. Actuation, Ungask.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roof Drain (3-in. Diameter)-Open	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roof Leg (3-in. Diameter)-Adjustable, Center Area, Ungasketed	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Roof Leg (3-in. Diameter)-Adjustable, Pontoon Area, Ungasketed	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Slotted Guide-Pole/Sample Well-Ungask. Sliding Cover, w/o Float	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Stub Drain (1-in. Diameter)-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vacuum Breaker (10-in. Diam.)-Weighted Mech. Actuation, Gask.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Fitting Loss Factors (Table 7.1-12)												
Access Hatch (24-in. Diam.)-Bolted Cover, Gasketed	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Automatic Gauge Float Well-Unbolted Cover, Ungasketed	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
Column Well (24-in. Diam.)-Built-Up Col.-Sliding Cover, Ungask.	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00
Gauge-Hatch/Sample Well (8-in. Diam.)-Slit fabric seal, 10% open area	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Ladder Well (36-in. Diam.)-Sliding Cover, Gasketed	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00
Rim Vent (6-in. Diameter)-Weighted Mech. Actuation, Ungask.	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Roof Drain (3-in. Diameter)-Open	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Roof Leg (3-in. Diameter)-Adjustable, Center Area, Ungasketed	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Roof Leg (3-in. Diameter)-Adjustable, Pontoon Area, Ungasketed	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Slotted Guide-Pole/Sample Well-Ungask. Sliding Cover, w/o Float	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
Stub Drain (1-in. Diameter)-	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Vacuum Breaker (10-in. Diam.)-Weighted Mech. Actuation, Gask.	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Vacuum Breaker (10-in. Diam.)-Weighted Mech. Actuation, Ungask.	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Deck Fitting Loss Factor (KF)												
Total Deck Fitting Loss Factor, lb-mole/yr (F_F)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00
Total Monthly Losses												
Rim Seal Loss (lb/month)	95.32	95.32	95.32	95.32	95.32	95.32	95.32	95.32	95.32	95.32	95.32	95.32
Withdrawal Loss (lb/month)	30.08	30.08	30.08	30.08	30.08	30.08	30.08	30.08	30.08	30.08	30.08	30.08
Deck Fitting Loss (lb/month)	67.59	67.59	67.59	67.59	67.59	67.59	67.59	67.59	67.59	67.59	67.59	67.59
Deck Seam Loss (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1Based on AP-42, November 2006, Section 7.1.3.1.

Annual Emissions Summary

Rim Seal Loss (lb/yr)	**1,143.82**
Withdrawal Loss (lb/yr)	**361.02**
Deck Fitting Loss (lb/yr)	**811.07**
Deck Seam Loss (lb/yr)	**0.00**

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Annual Internal Floating Roof Tank Calculations
EPN T-115 / FIN TT-115

Annual Floating Roof Tank Emissions

Variable	Input Data
Tank Identification	**Tank 115**
Location for Calculation Purposes	**Houston, Texas**
Tank Type - Roof Type	**IFR - Self Supporting Roof**
Rim-Seal System (Primary/Secondary)	**Vapor Mounted w/ Rim Mounted Secondary**
Deck Type (IFR Tanks Only)	**Welded**
Deck Construction (IFR w/bolted decks Only)	**N/A**
Type of Substance	**Organic Liquid**
Diameter, ft (D)	**75.0**
Throughput, gallons/year	**130,183,200**
Tank Paint Color	**Aluminum - Specular**
Tank Paint Condition	**Good**
Shell Condition	**Light Rust**

Monthly Emissions Calculations[1]

Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Type of Substance	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**
Multiple/Single Component	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**	**Isooctene**
Ideal Gas Constant, psia ft3/lbmole °R (R)	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Average Daily Minimum Ambient Temperature, F	39.70	42.60	50.00	58.10	64.40	70.60	72.40	72.00	67.90	57.60	49.60	42.20
Average Daily Maximum Ambient Temperature, F	61.00	65.30	71.10	78.40	84.60	90.10	92.70	92.50	88.40	81.60	72.40	64.70
Daily Total Solar Insolation Factor, Btu/ft^2/day (I)	843.30	1084.11	1347.45	1590.47	1784.01	1910.60	1887.12	1778.62	1545.74	1330.31	973.38	790.95
Daily Average Ambient Temperature, F	50.4	54.0	60.6	68.3	74.5	80.4	82.6	82.3	78.2	69.6	61.0	53.5
Tank Paint Solar Absorbance, dimensionless (α)	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390
Daily Vapor Temperature Range, R	24.5	28.2	29.9	32.0	34.0	34.9	35.2	34.2	31.6	31.8	27.0	24.8
Daily Average Liquid Surf. Temperature, F	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Daily Minimum Liquid Surf. Temperature, F	62.1	61.2	60.8	60.3	59.7	59.5	59.4	59.7	60.3	60.3	61.5	62.0
Daily Maximum Liquid Surf. Temperature, F	74.4	75.3	75.7	76.2	76.8	77.0	77.1	76.8	76.2	76.2	75.0	74.5
Liquid Bulk Temperature, F	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3	68.3
Vapor Molecular Weight, lb/lbmol (M_V)	112.21	112.21	112.21	112.21	112.21	112.21	112.21	112.21	112.21	112.21	112.21	112.21
Liquid Density, lb/gal (W_L)	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97
Liquid Mole Fraction	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Antoine's Coefficient A	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91	6.91
Antoine's Coefficient B	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24	1333.24
Antoine's Coefficient C	229.06	229.06	229.06	229.06	229.06	229.06	229.06	229.06	229.06	229.06	229.06	229.06
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097	0.7097
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.5982	0.5831	0.5760	0.5675	0.5593	0.5558	0.5546	0.5587	0.5689	0.5682	0.5878	0.5970
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.8381	0.8587	0.8686	0.8806	0.8926	0.8978	0.8997	0.8935	0.8786	0.8796	0.8522	0.8397
Daily Vapor Pressure range, psi	0.240	0.276	0.293	0.313	0.333	0.342	0.345	0.335	0.310	0.311	0.264	0.243
Ambient Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Average Ambient wind speed, mph (v)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Product Factor (K_C)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Zero wind speed rim seal loss factor (K_{sA})	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Wind speed dependent rim seal loss factor (K_{sb})	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Seal related wind speed exponent (n)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Shell Clingage Factor, bbl/1000 ft^2 (C_S)	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Number of Columns (N_C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Effective Column Diameter, ft (F_C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vapor Space Expansion Factor (K_E)	0.0593	0.0688	0.0733	0.0787	0.0840	0.0863	0.0871	0.0844	0.0778	0.0782	0.0658	0.0601
Vented Vapor Saturation Factor (K_S)	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150	0.150
Vapor Pressure Function (P*)	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237	0.01237
Number of Fittings (NF)												
Access Hatch (24-in. Diam.)-Bolted Cover, Gasketed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Automatic Gauge Float Well-Unbolted Cover, Ungasketed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Column Well (24-in. Diam.)-Built-Up Col.-Sliding Cover, Ungask.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gauge-Hatch/Sample Well (8-in. Diam.)-Slit fabric seal, 10% open area	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Ladder Well (36-in. Diam.)-Sliding Cover, Gasketed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rim Vent (6-in. Diameter)-Weighted Mech. Actuation, Ungask.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roof Drain (3-in. Diameter)-Open	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Roof Leg (3-in. Diameter)-Adjustable, Center Area, Ungasketed	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Roof Leg (3-in. Diameter)-Adjustable, Pontoon Area, Ungasketed	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Slotted Guide-Pole/Sample Well-Ungask. Sliding Cover, w/o Float	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Stub Drain (1-in. Diameter)-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vacuum Breaker (10-in. Diam.)-Weighted Mech. Actuation, Gask.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Deck Fitting Loss Factors (Table 7.1-12)												
Access Hatch (24-in. Diam.)-Bolted Cover, Gasketed	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60
Automatic Gauge Float Well-Unbolted Cover, Ungasketed	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
Column Well (24-in. Diam.)-Built-Up Col.-Sliding Cover, Ungask.	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00	47.00
Gauge-Hatch/Sample Well (8-in. Diam.)-Slit fabric seal, 10% open area	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Ladder Well (36-in. Diam.)-Sliding Cover, Gasketed	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00	56.00
Rim Vent (6-in. Diameter)-Weighted Mech. Actuation, Ungask.	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Roof Drain (3-in. Diameter)-Open	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Roof Leg (3-in. Diameter)-Adjustable, Center Area, Ungasketed	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Roof Leg (3-in. Diameter)-Adjustable, Pontoon Area, Ungasketed	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Slotted Guide-Pole/Sample Well-Ungask. Sliding Cover, w/o Float	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00
Stub Drain (1-in. Diameter)-	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Vacuum Breaker (10-in. Diam.)-Weighted Mech. Actuation, Gask.	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Vacuum Breaker (10-in. Diam.)-Weighted Mech. Actuation, Ungask.	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Deck Fitting Loss Factor (KF)												
Total Deck Fitting Loss Factor, lb-mole/yr (F_F)	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00	117.00
Total Monthly Losses												
Rim Seal Loss (lb/month)	19.08	19.08	19.08	19.08	19.08	19.08	19.08	19.08	19.08	19.08	19.08	19.08
Withdrawal Loss (lb/month)	29.07	29.07	29.07	29.07	29.07	29.07	29.07	29.07	29.07	29.07	29.07	29.07
Deck Fitting Loss (lb/month)	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53	13.53
Deck Seam Loss (lb/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1Based on AP-42, November 2006, Section 7.1.3.1.

Annual Emissions Summary

Rim Seal Loss (lb/yr)	**229.00**
Withdrawal Loss (lb/yr)	**348.82**
Deck Fitting Loss (lb/yr)	**162.38**
Deck Seam Loss (lb/yr)	**0.00**

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Cooling Tower Emissions Calculations
EPN F-CT-10 / FIN F-CT-10

Input Parameters

Parameter	Value	Units
Water Recirculation Rate	10,000	gpm
Operating Hours per Year	8,760	hrs/yr
Drift Rate [1]	0.0005	%
TDS [2]	1400	ppmw
VOC Emission Factor [3]	0.042	ppmw

[1] Total liquid drift rate based on Best Available Control Technology (BACT)

[2] Maximum TDS value based on AP-42 CH13.4 Table 13.4-1

[3] VOC Emission Factor based on Lowest Achievable Emission Rate (LAER)

Hourly and Annual Emissions

Hourly Emissions (lb/hr)				Annual Emissions (tpy) [3]			
PM [1]	PM_{10} [1]	$PM_{2.5}$ [1]	VOC [2]	PM	PM_{10}	$PM_{2.5}$	VOC
0.04	0.03	7.82E-05	0.21	0.15	0.11	3.42E-04	0.92

[1] Maximum hourly emissions calculated for the TDS value given above. Detailed calculations provided in the tables below.

[2] Hourly Emissions of VOC (lb/hr) = Water Recirculation Rate (gpm) * VOC Emission Factor (ppmw) / 1,000,000 * Water Density (lb/gal) * 60 (min/hr)

$$\text{Hourly Emissions of VOC (lb/hr)} = \frac{10{,}000 \text{ gal}}{\text{min}} \times \frac{0.042 \text{ ppmw}}{} \times \frac{1}{1{,}000{,}000} \times \frac{8.34 \text{ lb water}}{\text{gal}} \times \frac{60 \text{ min}}{\text{hr}} = 0.21 \text{ lb/hr}$$

[3] Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operating Hours (hrs/yr) * 1/2,000 (ton/lb)

$$\text{Annual Emissions of VOC (tpy)} = \frac{0.21 \text{ lb}}{\text{hr}} \times \frac{8{,}760 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lb}} = 0.92 \text{ tpy}$$

Particle Size Distribution of PM Emissions from Cooling Towers

Particle Size Distribution Based on TDS [1]

TDS (ppm):	1,400	
EPRI Droplet Diameter (µm) [1]	Particle Diameter (µm) [2]	EPRI % Mass Smaller [1]
10	0.86	0.000
20	1.72	0.196
30	2.58	0.226
40	3.44	0.514
50	4.30	1.816
60	5.16	5.702
70	6.02	21.348
90	7.74	49.812
110	9.46	70.509
130	11.18	82.023
150	12.90	88.012
180	15.48	91.032
210	18.06	92.468
240	20.64	94.091
270	23.22	94.689
300	25.80	96.288
350	30.10	97.011
400	34.41	98.340
450	38.71	99.071
500	43.01	99.071
600	51.61	100.000

[1] Particle size distribution calculated based on emission calculations outlined in Reisman, J. and G. Frisbie "Calculating Realistic PM_{10} Emissions from Cooling Towers", Greystone Environmental Consultants, Inc., 650 University Avenue, Suite 100, Sacramento, CA 95825. The EPRI Droplet Diameter and the EPRI % Mass Smaller are obtained from Table 1 of this reference.

[2] Solid particle diameter is based on the reference cited above and is calculated from EPRI droplet diameter assuming that each water droplet evaporates shortly after being emitted into a single, solid, spherical particle using the equation below.

$$D_p = D_d[(TDS)\left(\frac{\rho_w}{\rho_{TDS}}\right)]^{1/3}$$

Where

TDS is in units of ppmw

D_p = diameter of solid particle (μm)

D_{id} = diameter of drift droplet (μm)

Other assumptions include:

$\rho_{droplet}$	1	g/cm^3
ρ_{solid}	2.2	g/cm^3

$PM_{10}/PM_{2.5}$ Percents Calculation

X1 =	1.72	Y1 =	0.196
Desired Diam X2 =	2.50	Y2 =	0.223
X3 =	2.58	Y3 =	0.226
X1 =	9.46	Y1 =	70.51
Desired Diam X2 =	10.00	Y2 =	74.11
X3 =	11.18	Y3 =	82.02

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Cooling Tower Emissions Calculations
EPN F-CT-10 / FIN F-CT-10

Particle Size Distribution and Emission Rates for PM_{10} and $PM_{2.5}$

TDS (ppm)	Solid Particle Diameter used for PM_{10} [1]	% of Particles where diameter = 10 µm [1]	Solid Particle Diameter used for $PM_{2.5}$ [1] (µm)	% of Particles where diameter = 2.5 µm [1]	Hourly Emission Rate (lb/hr) [2, 3, 4]		
					PM	PM_{10}	$PM_{2.5}$
1,400	10.00	74.11	2.50	0.22	0.04	0.03	7.82E-05

[1] Based on methodology outlined in Reisman, J. and G. Frisbie "Calculating Realistic PM_{10} Emissions from Cooling Towers", Greystone Environmental Consultants, Inc., 650 University Avenue, Suite 100, Sacramento, CA 95825.

[2] Hourly Emissions of PM (lb/hr) = Water Circulation Rate (gpm) * Drift Rate (%) / 100 x TDS (ppmw) * 8.34 (lb water/gal) * 60 (min/hr)

$$\text{Hourly Emissions of PM (lb/hr)} = \frac{10{,}000 \text{ gal}}{\text{min}} \times \frac{0.0005}{100} \times \frac{1{,}400 \text{ parts solids}}{1{,}000{,}000 \text{ part water}} \times \frac{8.34 \text{ lb water}}{\text{gal}} \times \frac{60 \text{ min}}{\text{hr}} = 0.04 \text{ lb/hr}$$

[3] Hourly Emissions of PM_{10} (lb/hr) = Hourly Emissions of PM (lb/hr) * PM_{10} Portion of PM (%) / 100

$$\text{Hourly Emissions of } PM_{10} \text{ (lb/hr)} = \frac{0.04 \text{ lb}}{\text{hr}} \times \frac{74.11}{100} = 0.03 \text{ lb/hr}$$

[4] Hourly Emissions of $PM_{2.5}$ (lb/hr) = Hourly Emissions of PM (lb/hr) * $PM_{2.5}$ Portion of PM (%) / 100

$$\text{Hourly Emissions of } PM_{2.5} \text{ (lb/hr)} = \frac{0.04 \text{ lb}}{\text{hr}} \times \frac{0.22}{100} = 7.82\text{E-}05 \text{ lb/hr}$$

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Fugitive Components Emissions Calculations
EPN FUG-BD-V / FIN FUG-BD-V

Emissions Summary

Pollutant	Emission Rates (lb/hr)	Emission Rates (tpy)
VOC	0.34	1.18

Component Fugitive Emissions

Equipment/Service	Component Count	Emission Factor [1] [(lb/hr)/component]	LDAR Program	Reduction Credit [2]	Emissions (lb/hr)	Emissions (tpy)
Valves						
Gas/Vapor	20	0.0089	28 LAER	97%	5.34E-03	0.02
Light Liquid	13	0.0035	28 LAER	97%	1.37E-03	5.98E-03
Heavy Liquid	15	0.0007	28 LAER	30%	7.35E-03	0.03
Pumps						
Light Liquid	2	0.0386	28 LAER	93%	5.40E-03	0.02
Heavy Liquid	1	0.0161	28 LAER	30%	0.01	0.05
Flanges/Connectors						
Gas/Vapor	232	0.0029	28 LAER	97%	0.02	0.09
Light Liquid	296	0.0005	28 LAER	97%	4.44E-03	0.02
Heavy Liquid	143	0.00007	28 LAER	30%	7.01E-03	0.03
Relief Valve[3]						
Gas/Vapor	2	0.2293	28 LAER	100%	0	0
Light Liquid	1	0.0035	28 LAER	100%	0	0
Sampling Connections[4]	2	0.033	28 LAER	0%	0.07	3.30E-05
				Total Emissions:	**0.13**	**0.27**
				% VOC	**111%**	**111%**
				VOC Emissions	**0.14**	**0.30**

[1] Emission Factors from the *TCEQ Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance (APDG 6422v2)* dated 6/18, for SOCMI facilities without ethylene (< 11%).
[2] Reduction credits based on Table V: Control Efficiences for LDAR from the *TCEQ Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance (APDG 6422v2)* dated 6/18.
[3] Relief valves will be routed back to process or to control device, so 100% credit is applied.
[4] Emission factor for Sampling Connections is in terms of pounds per hour per sample taken.

Speciated Component VOC Emissions

Speciation	Wt%	Houlry Emissions (lb/hr)	Annual Emission (tpy)
Propylene	0.27%	0.00	0.00
Butane	11.46%	0.01	0.03
Isobutane	13.28%	0.02	0.04
Butene	25.91%	0.03	0.07
Butadiene	18.00%	0.02	0.05
Pentane	1.03%	0.00	0.00
Furfural	5.39%	0.01	0.01
DMF	1.42%	0.00	0.00
Olefins-U	7.45%	0.01	0.02
DIB	5.72%	0.01	0.02
Methanol	3.41%	0.00	0.01
MTBE	5.25%	0.01	0.01
Isooctene	5.25%	0.01	0.01
ETBE	5.25%	0.01	0.01
Fuel Oil	1.41%	0.00	0.00

Process Drain Emissions

Equipment/Service	Component Count	Emission Factor[1] [(lb/hr)/component]	LDAR Program	Reduction Credit[2]	Emissions (lb/hr)	Emissions (tpy)
Process Drains	520	0.07	28 LAER	95%	1.82	7.97
				Total Emissions:	**1.82**	**7.97**
				% VOC	**11%**	**11%**
				VOC Emissions	**0.20**	**0.88**

[1] Emission Factors from the *TCEQ Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance (APDG 6422v2)* dated 6/18, refinery factor from process drains from Table II: Facilty/Compound Specific Fugitive Emissions Factors.
[2] Reduction credit based on quarterly monitoring of process drains.

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EPN FUG-BD-V / FIN FUG-BD-V

Speciated Process VOC Emissions

Speciation	Wt%	Houlry Emissions (lb/hr)	Annual Emission (tpy)
Propylene	0.03%	0.00	0.00
Butane	1.15%	0.02	0.09
Isobutane	1.33%	0.02	0.11
Butene	2.59%	0.05	0.21
Butadiene	1.80%	0.03	0.14
Pentane	0.10%	0.00	0.01
Furfural	0.54%	0.01	0.04
DMF	0.14%	0.00	0.01
Olefins-U	0.75%	0.01	0.06
DIB	0.57%	0.01	0.05
Methanol	0.34%	0.01	0.03
MTBE	0.53%	0.01	0.04
Isooctene	0.53%	0.01	0.04
ETBE	0.53%	0.01	0.04
Fuel Oil	0.14%	0.00	0.01
Water	90.00%	0.12	0.25

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Summary
EPN MSS-BD / FIN MSS-BD
EPN MSS-FLR / FIN MSS-FLR

Emissions Summary

EPN	Description	VOC		CO		NO_X		SO_2		CO2e
		(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)
MSS-BD	Heat Exchangers	0.19	<0.01	--	--	--	--	--	--	--
MSS-BD	Internal Floating Roof Tanks	188.04	0.89	--	--	--	--	--	--	--
MSS-BD	Towers	1.21	<0.01	--	--	--	--	--	--	--
MSS-BD	Vessel Openings (Drums/Condensate Pots)	0.07	<0.01	--	--	--	--	--	--	--
MSS-BD	Centrifugal Pumps	<0.01	<0.01	--	--	--	--	--	--	--
MSS-FLR	Portable Flare	3.08	0.02	1.39	0.01	0.16	0.00	< 0.01	<0.01	6.67

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Calculations - Heat Exchangers
EPN MSS-BD / FIN MSS-BD

Emissions Summary[1,2,3]

Pollutant	Emission Rates	
	EPN MSS-BD (lb/hr)	EPN MSS-BD (tpy)
VOC	0.19	<0.01

[1]Twelve (12) heat exchangers may be opened simultaneously.
[2]Fourteen (14) heat exchangers are being added to the ETBE unit.
[3]Emissions represent the worst case operating scenario using the combination of heat exchanger and chemical that produce the highest emissions.

Vapor Space Emissions Calculations

Chemical[1]	Displaced Volume[2] (ft^3)	Total Vessel Pressure (psia)	Vessel Temperature (°F)	Vapor Molecular Weight (lb/lb-mol)	Concentration of Vapor[3] (ppmv)	# Events Per Hour	# Events Per Year	Saturated Vapor Emissions (lb/hr)	Saturated Vapor Emissions (tpy)
Isobutylene	126.7	14.7	95.0	56.1	500	12	14	0.11	<0.01
ETBE	126.7	14.7	95.0	102.2	500	12	14	0.19	<0.01
Ethanol	126.7	14.7	95.0	46.1	500	12	14	0.09	<0.01

[1]Chemicals expected to be found in ETBE unit. All chemicals have a VP > 0.1 psia (neglect clingage emissions).
[2]Based on largest heat exchanger in ETBE unit.
[3]Maximum expected VOC concentration during purging.

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Calculations - Towers
EPN MSS-BD / FIN MSS-BD

Emissions Summary[1,2,3]

Pollutant	Emission Rates	
	EPN MSS-BD	EPN MSS-BD
	(lb/hr)	(tpy)
VOC	1.21	0.001

[1]Three (3) towers may be opened simultaneously.
[2]Four (4) towers are being added to the ETBE/iC8 units.
[3]Emissions represent the worst case operating scenario using the combination of tower system and chemical that produce the highest emissions.

Vapor Space Emissions Calculations

Chemical[1]	Displaced Volume[2] (ft^3)	Total Vessel Pressure (psia)	Vessel Temperature (°F)	Vapor Molecular Weight (lb/lb-mol)	Concentration of Vapor[3] (ppmv)	# Events Per Hour	# Events Per Year	Saturated Vapor Emissions (lb/hr)	Saturated Vapor Emissions (tpy)
DIB	2,920.7	14.7	95.0	112.2	500	3	4	1.21	0.001
Isooctene	2,920.7	14.7	95.0	112.2	500	3	4	1.21	0.001
Isobutylene	2,920.7	14.7	95.0	56.1	500	3	4	0.61	0.000
ETBE	2,920.7	14.7	95.0	102.2	500	3	4	1.11	0.001
Ethanol	2,920.7	14.7	95.0	46.1	500	3	4	0.50	0.000

[1]Chemicals expected to be found in ETBE and iC8 units. All chemicals have a VP > 0.1 psia (neglect clingage emissions).
[2]Based on largest heat exchanger in ETBE/iC8 units.
[3]Maximum expected VOC concentration during purging.

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Calculations - Towers
EPN MSS-BD / FIN MSS-BD

Emissions Summary[1,2,3]

Pollutant	Emission Rates	
	EPN MSS-BD	EPN MSS-BD
	(lb/hr)	(tpy)
VOC	0.07	<0.01

[1]Assume all three (3) vessels may be opened simultaneously.

[1]Two (2) condensate pots for the ETBE/iC8 units and one (1) methanol drum being added for the HNO Plant.

[3]Emissions represent the worst case operating scenario using the combination of vessel and chemical that produce the highest emissions.

Vapor Space Emissions Calculations

Equipment	Chemical[1]	Displaced Volume[2] (ft^3)	Total Vessel Pressure (psia)	Vessel Temperature (°F)	Vapor Molecular Weight (lb/lb-mol)	Concentration of Vapor[3] (ppmv)	# Events Per Hour	# Events Per Year	Saturated Vapor Emissions (lb/hr)	Saturated Vapor Emissions (tpy)
ETBE Condensate Pot	Ethanol	190.85	14.7	95	46.07	500	3	3	<0.032561	1.63E-05
ETBE Condensate Pot	Isobutylene	190.85	14.7	95	56.11	500	3	3	0.040	1.98E-05
ETBE Condensate Pot	ETBE	190.85	14.7	95	102.18	500	3	3	0.072	3.61E-05
MeOH Hold Drum	Methanol	190.85	14.7	95	32.04	500	3	3	<0.02261	1.13E-05

[1]Chemicals expected to be found in ETBE unit and HNO Plant. All chemicals have a VP > 0.1 psia (neglect clingage emissions).

[2]Based on largest heat exchanger in ETBE unit and HNO Plant.

[3]Maximum expected VOC concentration during purging.

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Calculations - Pumps
EPN MSS-BD / FIN N MSS-BD

Emissions Summary[1,2,3]

Pollutant	Emission Rates	
	EPN MSS-BD (lb/hr)	EPN MSS-BD (tpy)
VOC	<0.01	<0.01

[1]Four (4) pumps may be opened simultaneously.
[1]Four (4) centrifugal pumps being added for the ETBE/iC8 units.
[3]Emissions represent the worst case operating scenario using the combination of pump and chemical that produce the highest emissions.

Vapor Space Emissions Calculations

Pump Size	Chemical[1]	Displaced Volume[2] (ft^3)	Total Vessel Pressure (psia)	Vessel Temperature (°F)	Vapor Molecular Weight (lb/lb-mol)	Concentration of Vapor[3] (ppmv)	# Events Per Hour	# Events Per Year	Saturated Vapor Emissions (lb/hr)	Saturated Vapor Emissions (tpy)
Large	DIB	0.98	14.7	95	112	500	4	4	5.45E-04	2.73E-07
Large	Isooctene	0.98	14.7	95	112	500	4	4	5.45E-04	2.73E-07
Large	Isobutylene	0.98	14.7	95	56	500	4	4	2.73E-04	1.36E-07
Large	ETBE	0.98	14.7	95	102	500	4	4	4.97E-04	2.48E-07
Large	Ethanol	0.98	14.7	95	46	500	4	4	2.24E-04	1.12E-07

[1]Chemicals expected to be found in ETBE and iC8 units. All chemicals have a VP > 0.1 psia (neglect clingage emissions).
[2]Based on largest heat exchanger in ETBE/iC8 units.
[3]Maximum expected VOC concentration during purging.

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Houston Plant - Houston, Texas
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MSS Emissions Calculations - IFR Tanks
EPN MSS-BD / FIN MSS-BD

Emissions Summary[1,2]

Pollutant	Uncontrolled Emissions		Controlled Emissions[3]	
	EPN MSS-BD	EPN MSS-BD	EPN MSS-FLR	EPN MSS-FLR
	(lb/hr)	(tpy)	(lb/hr)	(tpy)
VOC	188.04	0.89	3.08	0.025

[1]Tank 2D-6 will be used as an MTBE/ETBE/DIB/IC8 storage tank. Emissions represent the worst-case operating scenario with the worst-case storage material producing the highest emissions.
[2]Hourly emissions are based on either one cleaning or one change of service (whichever produces the highest emissions) in any given hour. Annual emissions are based on one cleaning and one change of service taking place in a year.
[3]Emissions are controlled by a portable flare

Tank Vapor Space Volume[1]

Tank ID	Tank Type	Tank Diameter, D (ft)	Leg Height, h_L (ft)	Heel Height, h_{LX} (ft)	Ideal Gas Constant, R (psia-ft^3/lbmol°R)	Vapor Space Volume, V_V (ft^3)
Tank 2D6	IFR	75	4.5	0.0	10.73	19,880

[1]Based on AP-42, November 2006, Section 7.1.3.1.
Equations:
V_V = Vapor Space Volume, ft^3 = $(\pi/4)*D^2*h_{le}$
where h_{le} = effective liquid height, ft = leg height - heel height = $h_L - h_{LX}$

Vapor Space Volume Calculation: $\frac{\pi}{4}$ 5,625 ft^2 (4.5 - 0.0) ft = 19,880 ft^3

Tank Contents

Tank ID	Tank Type	Activity	Material Stored	Daily Max Stock Temp[1] (°F)	Daily Ambient Average Temperature Range[2] (°R)	VP at Daily Max Stock Temp[3] (psia)	Liquid Density (lb/gal)	M_V - Vapor Molecular Weight (lb/lb-mol)	M_L - Liquid Molecular Weight (lb/lb-mol)
Tank 2D6	IFR	Cleaning	MTBE	95.0	35.22	7.21	6.18	88.15	88.15
Tank 2D6	IFR	Change of Service	MTBE	95.0	35.22	7.21	6.18	88.15	88.15
Tank 2D6	IFR	Cleaning	DIB	95.0	35.22	1.02	5.97	112.21	112.21
Tank 2D6	IFR	Change of Service	DIB	95.0	35.22	1.02	5.97	112.21	112.21
Tank 2D6	IFR	Cleaning	Isooctene	95.0	35.22	1.42	5.97	112.21	112.21
Tank 2D6	IFR	Change of Service	Isooctene	95.0	35.22	1.42	5.97	112.21	112.21
Tank 2D6	IFR	Cleaning	ETBE	95.0	35.22	3.71	6.14	102.17	102.17
Tank 2D6	IFR	Change of Service	ETBE	95.0	35.22	3.71	6.14	102.17	102.17

[1]The maximum liquid surface temperature for ambient storage tanks is 95°F. *Short-term Emissions from Floating Roof Tanks, APDG6419v1, Released 02/18.*
[2]Daily Ambient Average Temperature Range is based on EPA Tanks 4.09d Meterological Data for Houston, Texas and a tank paint solar absorbance (0.390) for an "Aluminum - Specular" tank
[3]Vapor pressure estimated using Antoine's equation. Antoine's coefficients were obtained from *Yaws' Handbook of Antoine Coefficients for Vapor Pressure (2nd Electronic Edition).*

Standing Idle Emissions[1,2]

											EPN MSS-BD		EPN MSS-FLR	
Tank ID	Tank Type	Activity	Material Stored	n_d - Number of Days Tank Stands Idle (Per Event)	# Events Per Year	K_E - Vapor Expansion Factor	K_S - Vapor Saturation Factor[2]	L_{SL} - Standing Idle Losses (lbs/event)	L_{SL} - Standing Idle Losses[3] (lbs/hr)	Capture Efficiency	Portable Flare Efficiency	Uncontrolled L_{SL} - Standing Idle Losses (lb/hr)	Uncontrolled L_{SL} - Standing Idle Losses (tpy)	Controlled L_{SL} - Standing Idle Losses (lb/hr)	Controlled L_{SL} - Standing Idle Losses (tpy)
Tank 2D6	IFR	Cleaning	MTBE	5.00	1.00	0.06	0.6	363.70	3.03	75.0%	98.0%	0.76	0.05	0.05	0.003
Tank 2D6	IFR	Change of Service	MTBE	1.00	1.00	0.06	0.6	72.74	3.03	0%	--	3.03	0.04	--	--
Tank 2D6	IFR	Cleaning	DIB	5.00	1.00	0.06	0.6	65.25	0.54	75.0%	98.0%	0.14	0.01	0.01	0.0005
Tank 2D6	IFR	Change of Service	DIB	7.00	1.00	0.06	0.6	91.34	0.54	0%	--	0.54	0.05	--	--
Tank 2D6	IFR	Cleaning	Isooctene	5.00	1.00	0.06	0.6	91.19	0.76	75.0%	98.0%	0.19	0.01	0.01	0.0007
Tank 2D6	IFR	Change of Service	Isooctene	7.00	1.00	0.06	0.6	127.67	0.76	0%	--	0.76	0.06	--	--
Tank 2D6	IFR	Cleaning	ETBE	5.00	1.00	0.06	0.6	216.92	1.81	75.0%	98.0%	0.45	0.03	0.03	0.002
Tank 2D6	IFR	Change of Service	ETBE	1.00	1.00	0.06	0.6	43.38	1.81	0%	--	1.81	0.02	--	--

[1]Based on AP-42, November 2006, Section 7.1.3.1.
[2]K_S = 0.6 for full liquid heel (Section 7.1.3.2.2)
[3]Standing Idle Losses with Liquid Heel are calculated using equation 2-16, L_{SL} (lbs/event) = $n_d * K_E * (PV_V/RT) * M_V * K_S$

Sample Calculations - Cleaning (MTBE)

Uncontrolled Emissions (lb/hr) = 5.00 day(s)/event × 0.06 × 7.21 psia × 19,880 ft^3 / (10.73 (psia-ft^3)/(lb-mol-°R) × 555.67 °R) × 0.6 × 88.15 lb/lb-mol × 1 event/120 hours × (1 - 0.75) = 0.76 lb/hr

Uncontrolled Emissions (tpy) = 0.76 lb/hr × 24.0 hours/day × 5.00 days/event × 1.00 event(s)/year × 1 ton/2000 lbs = 0.05 tpy

Controlled Emissions (lb/hr) = 5.00 day(s)/event × 0.06 × 7.21 psia × 19,880 ft^3 / (10.73 (psia-ft^3)/(lb-mol-°R) × 555.67 °R) × 0.6 × 88.15 lb/lb-mol × 1 event/120 hours × 75.0% × (1 - 0.98) = 0.05 lb/hr

Controlled Emissions (tpy) = 0.05 lb/hr × 24.0 hours/day × 5.00 days/event × 1.00 event(s)/year × 1 ton/2000 lbs = 0.003 tpy

Sample Calculations - Change of Service (MTBE)

Uncontrolled Emissions (lb/hr) = 1.00 day(s)/event × 0.06 × 7.21 psia × 19,880 ft^3 / (10.73 (psia-ft^3)/(lb-mol-°R) × 555.67 °R) × 0.6 × 88.15 lb/lb-mol × 1 event/24 hours = 3.03 lb/hr

Uncontrolled Emissions (tpy) = 3.03 lb/hr × 24.0 hours/day × 1.00 days/event × 1.00 event(s)/year × 1 ton/2000 lbs = 0.04 tpy

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MSS Emissions Calculations - IFR Tanks
EPN MSS-BD / FIN MSS-BD

Cleaning Emissions[1]

Tank ID	Tank Type	Activity	Material Stored	# Events Per Year	Cleaning Material Depth (ft)	Volume Displaced During Cleaning (ft^3)	Daily Max Stock Temp (°F)	VP at Daily Max Liq Temp (psia)	M_V - Vapor Molecular Weight (lb/lbmol)	K_S - Vapor Saturation Factor[2]	Cleaning Losses (lbs/event)	Hours Per Event (hrs)	Cleaning Losses[3] (lbs/hr)	Portable Flare Efficiency	EPN MSS-FLR	
															Controlled Cleaning Losses (lb/hr)	Controlled Cleaning Losses (tpy)
Tank 2D6	IFR	Cleaning	MTBE	1.00	4.5	19,880.4	95.0	7.21	88.15	0.6	1271.14	8.26	153.85	98.0%	3.08	0.013
Tank 2D6	IFR	Cleaning	DIB	1.00	4.5	19,880.4	95.0	1.02	112.21	0.6	228.03	8.26	27.60	98.0%	0.55	0.002
Tank 2D6	IFR	Cleaning	Isooctene	1.00	4.5	19,880.4	95.0	1.42	112.21	0.6	318.71	8.26	38.58	98.0%	0.77	0.003
Tank 2D6	IFR	Cleaning	ETBE	1.00	4.5	19,880.4	95.0	3.71	102.17	0.6	758.13	8.26	91.76	98.0%	1.84	0.008

[1]Based on AP-42, November 2006, Section 7.1.3.1.

[2]K_S = 0.6 for full liquid heel (Section 7.1.3.2.2)

[3]Cleaning Losses are calculated using equation 2-23, L_{CL} (lbs/event) = $K_S * (PV_V/RT) * M_V$

Sample Calculations - Cleaning (MTBE)

Uncontrolled Emissions (lb/hr) = 0.60 × 7.21 psia / 10.73 (psia-ft^3)/(lb-mol-°R) × 19,880 ft^3 / 555.67 °R × 88.15 lb / lb-mol × 1 event / 8.26 hours × (1 - 0.98) = 3.08 lb/hr

Uncontrolled Emissions (tpy) = 3.08 lb / hr × 8.26 hours / event × 1.00 event(s) / year × 1 ton / 2000 lbs × (1 - 0.98) = 0.013 tpy

Refloating Emissions[1, 2, 3]

Tank ID	Tank Type	Activity	Material Stored	# Events Per Year	Liquid Heel	Daily Max Stock Temp (°F)	VP at Daily Max Liq Temp (psia)	M_V - Vapor Molecular Weight (lb/lbmol)	Filling Saturation Factor[2], S	Maximum Filling Rate (gph)	Filling Rate (hours)	Capture Efficiency	Portable Flare Efficiency	Refloating Losses[3] (lbs/event)	Refloating Losses (lbs/hr)	EPN MSS-BD		EPN MSS-FLR	
																Uncontrolled Refloating Losses (lbs/hr)	Uncontrolled Refloating Losses (tpy)	Controlled Refloating Losses (lbs/hr)	Controlled Reloating Losses (tpy)
Tank 2D6	IFR	Cleaning	MTBE	1.00	Full Liquid Heel	95.0	7.21	88.15	0.6	22,000.00	6.76	75.0%	98.0%	1271.14	188.04	47.0	0.16	2.821	0.010
Tank 2D6	IFR	Change of Service	MTBE	1.00	Full Liquid Heel	95.0	7.21	88.15	0.6	22,000.00	6.76	0.00%	--	1271.14	188.04	188.0	0.64	--	--
Tank 2D6	IFR	Cleaning	DIB	1.00	Full Liquid Heel	95.0	1.02	112.21	0.6	22,000.00	6.76	75.0%	98.0%	228.03	33.73	8.4	0.03	0.506	0.002
Tank 2D6	IFR	Change of Service	DIB	1.00	Full Liquid Heel	95.0	1.02	112.21	0.6	22,000.00	6.76	0.00%	--	228.03	33.73	33.7	0.11	--	--
Tank 2D6	IFR	Cleaning	Isooctene	1.00	Full Liquid Heel	95.0	1.42	112.21	0.6	22,000.00	6.76	75.0%	98.0%	318.71	47.15	11.8	0.04	0.707	0.002
Tank 2D6	IFR	Change of Service	Isooctene	1.00	Full Liquid Heel	95.0	1.42	112.21	0.6	22,000.00	6.76	0.00%	--	318.71	47.15	47.1	0.16	--	--
Tank 2D6	IFR	Cleaning	ETBE	1.00	Full Liquid Heel	95.0	3.71	102.17	0.6	22,000.00	6.76	75.0%	98.0%	758.13	112.15	28.0	0.09	1.682	0.006
Tank 2D6	IFR	Change of Service	ETBE	1.00	Full Liquid Heel	95.0	3.71	102.17	0.6	22,000.00	6.76	0.00%	--	758.13	112.15	112.2	0.38	--	--

[1]Based on AP-42, November 2006, Section 7.1.3.1.

[2]S = 0.6 for full liquid heel (Section 7.1.3.2.2)

[3]Filling Losses with Liquid Heel are calculated using equation 2-26, L_{FL} (lbs/event) = $(PV_V/RT) * M_V * S$

Sample Calculations - Cleaning (MTBE)

Uncontrolled Emissions (lb/hr) = 1.00 event(s) / year × 0.6 × 7.21 psia / 10.73 (psia-ft^3)/(lb-mol-°R) × 19,880 ft^3 / 555.67 °R × 88.15 lb / lb-mol × 1 event / 6.76 hours × (1 - 0.75) = 47.01 lb/hr

Uncontrolled Emissions (tpy) = 47.01 lb / hr × 6.76 hours / event × 1.00 event(s) / year × 1 ton / 2000 lbs = 0.16 tpy

Controlled Emissions (lb/hr) = 1.00 event(s) / year × 0.6 × 7.21 psia / 10.73 (psia-ft^3)/(lb-mol-°R) × 19,880 ft^3 / 555.67 °R × 88.15 lb / lb-mol × 1 event / 6.76 hours × 75.0% × (1 - 0.98) = 2.82 lb/hr

Controlled Emissions (tpy) = 1271.14 lb / hr × 6.76 hours / event × 1.00 event(s) / year × 1 ton / 2000 lbs = 0.010 tpy

Sample Calculations - Change of Service (MTBE)

Uncontrolled Emissions (lb/hr) = 1.00 event(s) / year × 0.6 × 7.21 psia / 10.73 (psia-ft^3)/(lb-mol-°R) × 19,880 ft^3 / 555.67 °R × 88.15 lb / lb-mol × 1 event / 6.76 hours = 188.04 lb/hr

Uncontrolled Emissions (tpy) = 188.04 lb / hr × 6.76 hours / event × 1.00 event(s) / year × 1 ton / 2000 lbs = 0.636 tpy

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Calculations - Portable Flare
EPN MSS-FLARE / FIN MSS-FLARE

Emissions Summary

Pollutant	Emission Rates	
	EPN MSS-FLR (lb/hr)	EPN MSS-FLR (tpy)
NO_X	0.162	0.001
CO	1.387	0.011
VOC	3.077	0.025
SO_2	0.000	0.000
N_2O	--	0.000
CH_4	--	0.000
CO_2	--	6.652
CO_2e	--	6.667

Speciated VOC Emissions

Component	CAS No.	Stream Mass Flowrate[1] (lb/hr)	Stream Mass Flowrate[1] (tpy)	DRE[2] (%)	Post-Combustion VOC Emissions[3,4] (lb/hr)	Post-Combustion VOC Emissions[3,4] (tpy)
MTBE	1634-04-4	153.85	1.25	98%	3.077	0.025
DIB	25167-70-8	27.60	0.22	98%	0.552	0.004
Isooctene	107-39-1	38.58	0.31	98%	0.772	0.006
ETBE	637-92-3	91.76	0.74	98%	1.835	0.015

[1] Mass flow rate represents only VOC contributions from waste streams.

[2] Per TCEQ Best Available Control Technology for Flares and Vapor Combustors (dated, 08/2011), DRE is 99% for certain compounds up to three carbons, 98% otherwise.

[3] Example hourly emissions calculations:
Hourly Uncombusted Gas Flare Emissions (lb/hr) = Mass Flowrate (lb/hr) * (1 - DRE/100)

$$\text{Hourly Uncombusted Gas Emissions from MTBE (lb/hr)} = \frac{153.85 \text{ lb}}{\text{hr}} \left| \frac{(1 - 0.98)}{} \right. = 3.08 \text{ lb/hr}$$

[4] Example annual emissions calculations:
Hourly Uncombusted Gas Flare Emissions (lb/hr) = Annual (tpy) * (1 - DRE/100)

$$\text{Annual Uncombusted Gas Emissions from MTBE (tpy)} = \frac{1.25 \text{ lb}}{\text{hr}} \left| \frac{(1 - 0.98)}{} \right. = 0.02 \text{ tpy}$$

Stream Calculation Details

Stream	Inputs	Value	Units
Pilot Gas	Operating Hours	326	hrs
Waste Stream			

Pilot Gas Composition

Component	CAS No.	Molecular Weight (lb/lb-mol)	Mass Fraction	Stream Mass Flowrate (lb/hr)	Stream Mass Flowrate (tpy)	Component Heating Value (Btu/lb)	Hourly Stream Heating Value (Btu/hr)	Annual Stream Heating Value (Btu/yr)	Total CO_2 after Combustion (tpy)
Methane	74-82-8	16.04	1.0	0.14	0.02	22,000	3,025	984,852	0.06

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
MSS Emissions Calculations - Portable Flare
EPN MSS-FLARE / FIN MSS-FLARE

Waste Gas Stream Compostion

							Hourly	Annual	
Component	CAS No.	Molecular Weight (lb/lb-mol)	Mass Fraction	Stream Mass Flowrate (lb/hr)	Stream Mass Flowrate (tpy)	Component Heating Value (Btu/lb)	Stream Heating Value (Btu/hr)	Stream Heating Value (Btu/yr)	Total CO_2 after Combustion (tpy)
MTBE	1634-04-4	88.15	1.000	153.85	1.25	16,400	2,523,208	40,955,278	3.05
DIB	25167-70-8	112.21	1.000	27.60	0.22	20,100	554,768	9,004,676	0.69
Isooctene	107-39-1	112.21	1.000	38.58	0.31	20,100	775,376	12,585,469	0.96
ETBE	637-92-3	102.17	1.000	91.76	0.74	16,900	1,550,768	25,171,183	1.89

Combustion Emissions (NO_X, CO, SO_2)

Emission Factors

Pollutant	Flare Factors[1, 2] (lb/MMBtu)
SO_2	5.60E-03
NO_X	0.064
CO	0.550

[1] NO_X and CO emission factors based on TCEQ's "Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers" (dated October 2000). Factors are maximum possible for low-BTU waste streams in air-assisted flares.
[2] SO_2 emission factor based on 2 grains/100 scf from pilot natural gas (1020 Btu/lb).

Fuel Gas Sulfur:

$$\frac{2\text{ gr Sulfur}}{100\text{ scf}} \times \frac{\text{lb}}{7000\text{ gr}} \times \frac{\text{scf}}{1020\text{ Btu}} \times \frac{2\text{ lb-mol SO2}}{1\text{ lb-mol S}} \times \frac{1000000\text{ Btu}}{\text{MMBtu}} = 5.60\text{E-}03 \frac{\text{lb SO2}}{\text{MMBtu}}$$

Emissions from Combustion

Pollutant	Hourly[1] (lb/hr)	Annual[2] (tpy)
NO_X	0.162	0.001
CO	1.387	0.011
SO_2	0.00002	0.0000

GHG Emissions

Emission Factors

Pollutant	Emission Factor	Emission Factor Units
N_2O	0.0001	kg N_2O/MMBtu

[1] Nitrous oxide (N_2O) emission factor from 40 CFR 98, Subpart C, Table C-2 for Natural Gas. Assumed same factor for waste gas.

Annual Emissions (tpy)			
CO_2	CH_4	N_2O	CO_2e[1,2]
6.65	0.00	9.78E-06	6.67

[1] CO_2e (tpy) = CO_2 Emission (tpy) * CO_2 GWP + CH_4 Emission (tpy) * CH_4 GWP + N_2O Emission (tpy) * N_2O GWP
[2] Per 40 CFR 98 - Mandatory Greenhouse Gas Reporting, Subpart A, Table A-1. Total CO_2e emissions are calculated based on the following Global Warming Potentials (GWP):

Pollutant	GWP
CO_2	1
CH_4	25
N_2O	298

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Plant Flare Emissions Calculations
EPN EP-5 / FIN EP-5

Plant Flare (EP-5) Emissions Summary

Pollutant	Hourly (lb/hr)	Annual (tpy)
NO_X	29.09	3.44
CO	148.21	17.51
VOC	190.74	36.85
SO_2	<0.01	<0.01
1,3-Butadiene	70.42	4.42
N_2O	--	1.11E-02
CH_4	--	4
CO_2	--	6,870
CO_2e	--	6,984

Speciated VOC Emissions

Component	CAS No.	Stream Mass Flowrate[1] (lb/hr)	Stream Mass Flowrate[1] (tpy)	DRE[2] (%)	Post-Combustion VOC Emissions[3,4] (lb/hr)	Post-Combustion VOC Emissions[3,4] (tpy)
Ethylene	74-85-1	0.2	0.17	99%	0.002	0.002
Propane	74-98-6	204.0	24.06	99%	2.040	0.241
Propylene	115-07-1	176.4	24.74	99%	1.764	0.247
Isobutane	75-28-5	4263.2	1032.56	98%	85.264	20.651
n-Butane	106-97-8	1894.7	32.93	98%	37.895	0.659
Trans-2-butene	624-64-6	923.6	33.11	98%	18.472	0.662
Cis-2-butene	590-18-1	232.9	4.22	98%	4.658	0.084
1,3-Butadiene	106-99-0	2619.3	221.00	98%	52.387	4.420
1-Butene	106-98-9	3282.8	183.16	98%	65.656	3.663
Isobutylene	115-11-7	3568.0	237.60	98%	71.360	4.752
Pentane (C5+)	109-66-0	762.3	73.35	98%	15.247	1.467
Total VOC	--	9,768.8	1,866.89	--	190.74	36.85

[1] Annual Stream Mass Flowrate based on 7/2017. Hourly Stream Flowrate based on 1/17/18 12:00 PM.

[2] Per TCEQ Best Available Control Technology for Flares and Vapor Combustors (dated, 08/2011), DRE is 99% for certain compounds up to three carbons, 98% otherwise.

[3] Example hourly emissions calculations:
Hourly Uncombusted Gas Flare Emissions (lb/hr) = Mass Flowrate (lb/hr) * (1 - DRE/100)

$$\text{Hourly Uncombusted Gas Emissions from Isobutane (lb/hr)} = \frac{4263.21 \text{ lb}}{\text{hr}} \left| \frac{(1 - 0.98)}{} \right. = 85.26 \text{ lb/hr}$$

[4] Example annual emissions calculations:
Annual Uncombusted Gas Flare Emissions (tpy) = Hourly Waste Gas Emissions (lb/hr) * 8,760 hrs/yr * 1 ton / 2,000 lbs

$$\text{Annual Uncombusted Gas Emissions from Isobutane (tpy)} = \frac{1032.56 \text{ ton}}{\text{yr}} \left| \frac{(1 - 0.98)}{} \right. = 20.65 \text{ tpy}$$

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Plant Flare Emissions Calculations
EPN EP-5 / FIN EP-5

Stream Calculation Details

Stream	Inputs	Value	Units
Pilot Gas Waste Stream	Operating Hours	8,760	hrs

Pilot Gas Composition

EPN	EP-5
FIN	PROCEMISS

Component	CAS No.	Molecular Weight (lb/lb-mol)	Mass Fraction	Stream Mass Flowrate (lb/hr)	Stream Mass Flowrate (tpy)	Component Heating Value (Btu/lb)	Total Heat to Flare MMBtu/hr	Total Heat to Flare MMBtu/hr	Total CO_2 after Combustion (tpy)
Methane	74-82-8	16.04	1.0	56.29	246.54	22,000	1.238	10,848	670

Waste Gas Stream Compostion

EPN	EP-5
FIN	PROCFLARE

Component	CAS No.	Molecular Weight (lb/lb-mol)	Stream Mass Flowrate[1] (lb/hr)	Stream Mass Flowrate[1] (tpy)	Component Heating Value (Btu/lb)	Total Heat to Flare MMBtu/hr	Total Heat to Flare MMBtu/yr	Total CO_2 after Combustion (tpy)
Hydrogen	1333-74-0	2.02	2.19	2.31	61,200	0.134	282	0.0
Nitrogen	7727-37-9	28.01	332.04	125.59	0	0.000	0	0.0
Methane	74-82-8	16.04	1,567.43	197.79	24,000	37.618	9,494	532
Carbon Monoxide	630-08-0	28.01	0.00	1.02	4,300	0.000	9	2
Carbon Dioxide	124-38-9	44.01	22.27	8.45	0	0.000	0	8
Ethylene	74-85-1	28.05	0.17	0.17	21,000	0.004	7	1
Ethane	74-84-0	30.07	69.66	5.74	23,100	1.609	265	16
Propane	74-98-6	44.10	203.97	24.06	22,000	4.487	1,059	71
Propylene	115-07-1	42.08	176.37	24.74	23,000	4.056	1,138	76
Isobutane	75-28-5	58.12	4,263.21	1,032.56	22,000	93.791	45,433	3,065
n-Butane	106-97-8	58.12	1,894.73	32.93	23,000	43.579	1,515	98
Trans-2-butene	624-64-6	56.11	923.62	33.11	23,000	21.243	1,523	102
Cis-2-butene	590-18-1	56.11	232.92	4.22	23,000	5.357	194	13
1,3-Butadiene	106-99-0	54.09	2,619.33	221.00	21,000	55.006	9,282	705
1-Butene	106-98-9	56.11	3,282.80	183.16	22,000	72.222	8,059	563
Isobutylene	115-11-7	56.11	3,568.01	237.60	23,000	82.064	10,930	731
Pentane (C5+)	109-66-0	72.15	762.33	73.35	7,000	5.336	1,027	219

[1] Annual Stream Mass Flowrate based on 7/2017. Hourly Stream Flowrate based on 8/26/17 09:00 AM.

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Plant Flare Emissions Calculations
EPN EP-5 / FIN EP-5

Combustion Emissions (NO_X, CO, SO_2)

Emission Factors

EPN	FIN	Pollutant	Flare Factors[1, 2] (lb/MMBtu)
EP-5	PROCEMISS	NO_X	0.068
		CO	0.347
		SO_2	5.60E-04
EP-5	PROCFLARE	NO_X	0.068
		CO	0.347

[1] NO_X and CO emission factors based on TCEQ's "Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers" (dated October 2000). Factors are maximum possible for low-BTU waste streams in steam-assisted flares.
[2] SO_2 emission factor based on 0.2 grains/100 scf from pilot natural gas (1020 Btu/lb).

Fuel Gas Sulfur:

$$\frac{0.2\text{ gr Sulfur}}{100\text{ scf}} \times \frac{\text{lb}}{7000\text{ gr}} \times \frac{\text{scf}}{1020\text{ Btu}} \times \frac{2\text{ lb-mol SO2}}{1\text{ lb-mol S}} \times \frac{1000000\text{ Btu}}{\text{MMBtu}} = 5.60\text{E-}04\ \frac{\text{lb SO2}}{\text{MMBtu}}$$

EPN	FIN	MMBtu/hr	MMBtu/yr
EP-5	PROCEMISS	1.24	10,847.92
	PROCFLARE	426.5	90,215.9
	Total	**427.75**	**101,063.79**

Emissions from Combustion

Pollutant	Hourly[1] (lb/hr)	Annual[2] (tpy)
NO_X	29.1	3.44
CO	148.2	17.5
SO_2	0.0000	0.0000

GHG Emissions

Emission Factors

Pollutant	Emission Factor	Emission Factor Units
N_2O	0.0001	kg N_2O/MMBtu

[1] Nitrous oxide (N_2O) emission factor from 40 CFR 98, Subpart C, Table C-2 for Natural Gas. Assumed same factor for waste gas.

Annual Emissions (tpy)			
CO_2	CH_4	N_2O	CO_2e[1,2]
6,870	4	1.11E-02	6,984

[1] CO_2e (tpy) = CO_2 Emission (tpy) * CO_2 GWP + CH_4 Emission (tpy) * CH_4 GWP + N_2O Emission (tpy) * N_2O GWP
[2] Per 40 CFR 98 - Mandatory Greenhouse Gas Reporting, Subpart A, Table A-1. Total CO_2e emissions are calculated based on the following Global Warming Potentials (GWP):

Pollutant	GWP
CO_2	1
CH_4	25
N_2O	298

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Plant Flare Emissions Calculations
EPN EP-5 / FIN EP-5

1,3-Butadiene Emissions

Component	CAS No.	Stream Mass Flowrate[1] (lb/hr)	Stream Mass Flowrate[1] (tpy)	DRE[2] (%)	Post-Combustion VOC Emissions[3,4] (lb/hr)	Post-Combustion VOC Emissions[3,4] (tpy)
1,3-Butadiene	106-99-0	3,521	221	98%	70.42	4.42

[1] Annual Stream Mass Flowrate based on 7/2017. Hourly Stream Flowrate based on worst-case operational condition.

[2] Per TCEQ Best Available Control Technology for Flares and Vapor Combustors (dated, 08/2011), DRE is 99% for certain compounds up to three carbons, 98% otherwise.

[3] Example hourly emissions calculations:

Hourly Uncombusted Gas Flare Emissions (lb/hr) = Mass Flowrate (lb/hr) * (1 - DRE/100)

$$\text{Hourly Uncombusted Gas Emissions from 1,3-Butadiene (lb/hr)} = \frac{3521.00 \text{ lb}}{\text{hr}} \left| \frac{(1 - 0.98)}{} \right. = 70.42 \text{ lb/hr}$$

[4] Example annual emissions calculations:

Annual Uncombusted Gas Flare Emissions (tpy) = Hourly Waste Gas Emissions (lb/hr) * 8,760 hrs/yr * 1 ton / 2,000 lbs

$$\text{Annual Uncombusted Gas Emissions from 1,3-Butadiene (tpy)} = \frac{221.00 \text{ ton}}{\text{yr}} \left| \frac{(1 - 0.98)}{} \right. = 4.42 \text{ tpy}$$

TPC Group LLC
Houston Plant - Houston, Texas
NSR Permit No. 46307 Amendment - BD Unit Expansion
Speciated Flows to Flare
EPN EP-5 / FIN EP-5

Pilot Gas Stream

EPN	FIN	Compound	CAS No.	Molecular Weight (lb/lb-mole)	Heating Value (MMBtu/lb)	Hourly Mass Flow (lb/hr) [1]	Annual Mass Flow (lb/yr) [2]
EP-5	PROCEMISS	Methane	74-82-8	16.0426	0.022	56.288	493,087

Waste Gas Stream

EPN	FIN	Compound	CAS No.	Molecular Weight (lb/lb-mole)	Heating Value (MMBtu/lb)	Hourly Mass Flow (lb/hr) [1]	Annual Mass Flow (lb/yr) [2]
EP-5	PROCFLARE	Hydrogen	1333-74-0	2.0159	0.061	2.2	4,614.4
		Nitrogen	7727-37-9	28.014	0.000	332.0	251,170.3
		Methane	74-82-8	16.0426	0.024	1,567.4	395,586.2
		Carbon Monoxide	630-08-0	28.01	0.004	0.0	2,048.8
		Carbon Dioxide	124-38-9	44.009	0.000	22.3	16,901.6
		Ethylene	74-85-1	28.0536	0.021	0.2	348.8
		Ethane	74-84-0	30.0694	0.023	69.7	11,473.4
		Propane	74-98-6	44.0962	0.022	204.0	48,115.3
		Propylene	115-07-1	42.0804	0.023	176.4	49,476.6
		Isobutane	75-28-5	58.123	0.022	4,263.2	2,065,114.9
		n-Butane	106-97-8	58.123	0.023	1,894.7	65,853.9
		Trans-2-butene	624-64-6	56.1072	0.023	923.6	66,219.0
		Cis-2-butene	590-18-1	56.1072	0.023	232.9	8,442.0
		1,3-Butadiene	106-99-0	54.0914	0.021	2,619.3	442,000.0
		1-Butene	106-98-9	56.1072	0.022	3,282.8	366,316.6
		Isobutylene	115-11-7	56.1072	0.023	3,568.0	475,198.0
		Pentane (C5+)	109-66-0	72.1498	0.007	762.3	146,692.1

[1,2] Annual Stream Mass Flowrate based on 7/2017. Hourly Stream Flowrate based on 8/26/17 09:00 AM.

APPENDIX B: FNSR ANALYSIS

TCEQ Tables 1F-4F
TCEQ Table 4N
TCEQ Table 6N
TCEQ Table 9N

TPC Group LLC
Houston Plant - Houston, Texas
BD Expansion
Project Emissions Increase Summary

EPN	FIN	Permit	Description of Units	CO (tpy)	NO_X (tpy)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)	SO_2	CO2e (tpy)
New Units											
FUG-BD-V	FUG-BD-V	46307	Process Fugitives						1.18		
FUG-BD-D	FUG-BD-D	22052	Docks Fugitives						0.12		
TK-2D6	TK-2D6	46307	IFR MTBE/ETBE/DIB/IC8 Tank						1.16		
MSS-FLR	MSS-FLR	46307	TK-2D6 Degass Flare	0.01	0.00				0.02	0.00	6.67
MSS-BD	MSS-BD	46307	Vessel Openings						0.89		
DOCK-TO	DOCK-TO	22052	Dock Thermal Oxidizer	2.75	3.67	1.37	1.37	1.37	1.84	0.08	6,754
Boiler 12	Boiler 12	46426	Boiler 12	21.49	29.08	21.67	21.67	21.67	8.96	3.26	267,734
Increases for New Units				**24.25**	**32.75**	**23.04**	**23.04**	**23.04**	**14.18**	**3.34**	**274,494**
Modified Units											
C-5	01027	22052	Ship & Barge Loading Dock	--	--	--	--	--	0.00	--	
F-CT-10	F-CT-10	46307	Cooling Tower CT-10	--	--	0.00	0.00	0.00	0.70	--	
T-115	TT-115	46307	TANK STORAGE	--	--	--	--	--	0.00	--	
T-81	T-81	46307	No. 81 Tank	--	--	--	--	--	0.00	--	
T-82	T-82	46307	No. 82 Tank	--	--	--	--	--	0.74	--	
T-86	T-86	46307	No. 86 Tank	--	--	--	--	--	0.00	--	
Increases for Modified Units				**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.44**	**0.00**	**0.00**
Affected Units (BAE to PTE)											
EP-5	Multiple	46307	Plant Flare Total	10.20	2.27	--	--	--	22.85	0.00	
F-CT-3	CT-3	46307	COOLING TOWER 3	--	--	0.55	0.35	0.01	4.98	--	
F-CT-7	CT-7	46307	COOLING TOWER 7	--	--	0.00	0.00	0.00	2.25	--	
F-CT-11	F-CT-11	46307	Cooling Tower CT-11	--	--	0.00	0.00	0.01	0.15	--	
F-CT-17	CT-17	46307	Cooling Tower CT-17	--	--	1.60	1.09	0.01	6.71	--	
F-CT-18	CT-18	46307	Cooling Tower CT-18	--	--	1.21	0.85	0.01	5.20	--	
F-CT-14	F-CT-14	46307	Cooling Tower CT-14	--	--	0.02	0.00	0.01	3.39	--	
WW-IDS	WW-IDS	46307	Wastewater Drains System	--	--	--	--	--	1.92	--	
WW-PN	WW-PN	46307	Wastewater Aeration Ponds	--	--	--	--	--	3.70	--	
F-10A	OIL SEP	46307	OIL SEPARATOR	--	--	--	--	--	0.80	--	
F-TTR	TRUCK-RACK	46307	TRUCK RACK LOADING FACILITY	--	--	--	--	--	0.14	--	
LOAD-GRP	LOAD-GRP	46307	Loading Emissions Cap	--	--	--	--	--	0.00	--	
T-87	T-87	22052	Tank 87	--	--	--	--	--	0.46	--	
T-32	T-32	46307	No. 32 Tank	--	--	--	--	--	0.00	--	
T-36	T-36	46307	DIB Storage Tank 36	--	--	--	--	--	0.12	--	
T-37	T-37	46307	DIB Storage Tank 37	--	--	--	--	--	0.14	--	
T-71	T-71	46307	NO. 71 TANK	--	--	--	--	--	0.20	--	
T-72	T-72	46307	NO. 72 TANK	--	--	--	--	--	0.44	--	
T-73	T-73	46307	NO. 73 TANK	--	--	--	--	--	0.00	--	
T-74	T-74	46307	NO. 74 TANK	--	--	--	--	--	0.00	--	
T-80	T-80	46307	NO. 80 TANK	--	--	--	--	--	1.85	--	
T-103	TT-103	46307	TANK STORAGE	--	--	--	--	--	0.11	--	
T-114	TT-114	46307	TANK STORAGE	--	--	--	--	--	0.00	--	
2F26	2F26	46307	Furfural Sump Tank	--	--	--	--	--	0.01	--	
4F14	4F14	46307	Furfural Sump Tank	--	--	--	--	--	0.01	--	
5F3	5F3	46307	Furfural Sump Tank	--	--	--	--	--	0.01	--	
T-P1WW1	T-P1WW1	46307	T-P1WW1	--	--	--	--	--	0.01	--	
T-P1WW2	T-P1WW2	46307	TANK T-P1WW2	--	--	--	--	--	0.01	--	
T-P2WW1	T-P2WW1	46307	TANK T-P2WW1	--	--	--	--	--	0.01	--	
T-31	T-31	46307	No. 31 Tank	--	--	--	--	--	0.29	--	
T-33	T-33	46307	No. 33 Tank	--	--	--	--	--	0.00	--	
T-34	T-34	46307	No. 34 Tank	--	--	--	--	--	0.26	--	
T-69-1	T-69-1	46307	No. 69-1 Tank	--	--	--	--	--	0.01	--	
T-77	T-77	46307	NO. 77 TANK	--	--	--	--	--	0.05	--	
T-78	T-78	46307	NO. 78 TANK	--	--	--	--	--	0.05	--	
T-79	T-79	46307	NO. 79 TANK	--	--	--	--	--	0.21	--	
T-84	T-84	46307	No. 84 Tank	--	--	--	--	--	0.00	--	
T-85	T-85	46307	No. 85 Tank	--	--	--	--	--	0.00	--	
T-111	T-111	46307	Tank	--	--	--	--	--	0.01	--	
T-112	T-112	46307	Tank	--	--	--	--	--	0.01	--	
TNK-GRP	TNK-GRP	46307	Tank Emissions Cap	--	--	--	--	--	0.00	--	
T-155	T-155	46307	TEA Storage Tank	--	--	--	--	--	0.01	--	
1F-511	1F-511	46307	Tank	--	--	--	--	--	0.01	--	
Increases for Affected Units				**10.20**	**2.27**	**3.39**	**2.30**	**0.04**	**56.38**	**0.00**	**0.00**

Project Permits to Permits Increases	**24.25**	**32.75**	**23.04**	**23.04**	**23.04**	**15.61**	**3.34**	**274,494**
Project Emissions Increase	**34.45**	**35.02**	**26.42**	**25.34**	**23.08**	**71.99**	**3.34**	**274,494**
PSD/NNSR Significant Emission Rate	**100**	**25**	**25**	**15**	**10**	**25**	**40**	**75,000**
PSD/NNSR Netting Performed?	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**
Contemporaneous Emissions Change	**--**	**-290.38**	**24.84**	**24.05**	**21.95**	**--**	**--**	**--**
Net Emissions Increase (NEI)	**--**	**-255.36**	**51.26**	**49.38**	**45.03**	**--**	**--**	**--**
PSD/NNSR Review Required?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**

TABLE 1F
AIR QUALITY APPLICATION SUPPLEMENT

Permit No.: **46307, 46426, 22052**	Application Submittal Date: **February 2020**
Company: TPC Group LLC	
RN: **100219526**	Facility Location: **Houston Plant**
City: **Houston**	County: **Harris**
Permit Unit I.D.: **HNO**	Permit Name: **VERP (46307), Cogen (46426), Docks (22052)**
Permit Activity: New Source **x** Modification	

Complete for all Pollutants with a Project Emission Increase.	**POLLUTANTS**							
	Ozone							
	VOC	**NO_x**	**CO**	**PM**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**GHG (CO2e)**
Nonattainment?	**Yes**	**Yes**	**No**	**No**	**No**	**No**	**No**	**No**
PSD?	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Existing site PTE (tpy)?	**>50**	**>50**	**>100**	**>100**	**>100**	**>100**	**45.8**	**>75,000**
Proposed project emission increases (tpy from 2F[2])?	**71.99**	**35.02**	**34.45**	**26.42**	**25.34**	**23.08**	**3.34**	**274,494**
Is the existing site a major source?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**
If not, is the project a major source by itself?	**--**	**--**	**--**	**--**	**--**	**--**	**No**	**--**
If site is major source, is project increase significant?	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**No**	**Yes**
If netting required, estimated start of construction: Submittal Date February 2020								
5 years prior to start of construction contemporaneous: January 2015								
Estimated start of operation period: February 2020								
Net contemporaneous change, including proposed project, from Table 3F. (tpy)	**--**	**-255.36**	**--**	**51.26**	**49.38**	**45.03**	**--**	**--**
Major NSR Applicable?	**Yes**	**No**	**No**	**Yes**	**Yes**	**Yes**	**No**	**Yes**

Signature: _____ ***Title:*** _____ ***Date:*** _____

[1] Other pollutants. [Pb, H2S, TRS, H2SO4, Fluoride excluding HF, etc.]

[2] Sum of proposed emissions minus baseline emissions, increases only.

The representations made above and on the accompanying tables are true and correct to the best of my knowledge.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: CO	**Permit: 46307, 46426, 22052**
Baseline Period: 2017 to 2018	

				A	B				
Affected or Modified Facilities[2]									
	FIN	**EPN**	**Permit No.**	**Actual Emissions[3]**	**Baseline Emissions[4]**	**Proposed Emissions[5]**	**Projected Actual Emissions**	**Difference (B-A)[6]**	**Correction[7]**	**Project Increase[8]**
1	EP-5	EP-5	46307/22052	7.31	7.31	17.51		10.20	--	10.20
2	MSS-FLR	MSS-FLR	46307	0.00	0.00	0.01		0.01	--	0.01
3	DOCK-TO	DOCK-TO	22052	0.00	0.00	2.75		2.75	--	2.75
4	Boiler 12	Boiler 12	46426	0.00	0.00	21.49		21.49	--	21.49
								Page Subtotal[9]	--	**34.45**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

[10] Type of note. Generally would be baseline adjustment, basis for projected actual, or basis for correction (what could have been accommodated).

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: NO_x	**Permit:** 46307, 46426, 22052
Baseline Period: 2017 to 2018	

	A	B

Affected or Modified Facilities[2]										
	FIN	EPN	Permit No.	Actual Emissions[3]	Baseline Emissions[4]	Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6]	Correction[7]	Project Increase[8]
1	EP-5	EP-5	46307/22052	1.17	1.17	3.44		2.27	--	2.27
2	MSS-FLR	MSS-FLR	46307	0.00	0.00	0.00		0.00	--	0.00
3	DOCK-TO	DOCK-TO	22052	0.00	0.00	3.67		3.67	--	3.67
4	Boiler 12	Boiler 12	46426	0.00	0.00	29.08		29.08	--	29.08
								Page Subtotal[9]	--	**35.02**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: PM	**Permit:** 46307, 46426, 22052
Baseline Period: 2017 to 2018	

					A	B				
Affected or Modified Facilities[2]										
	FIN	**EPN**	**Permit No.**	**Actual Emissions[3]**	**Baseline Emissions[4]**	**Proposed Emissions[5]**	**Projected Actual Emissions**	**Difference (B-A)[6, 10]**	**Correction[7]**	**Project Increase[8]**
1	CT-3	F-CT-3	46307	2.95	2.95	3.50		0.55	--	0.55
2	CT-7	F-CT-7	46307	0.46	0.46	0.46		0.00	--	0.00
3	CT-10	F-CT-10	46307	0.21	0.21	0.15		-0.06	--	0.00
4	CT-11	F-CT-11	46307	0.05	0.05	0.05		0.003	--	0.00
5	CT-14	F-CT-14	46307	0.32	0.32	0.34		0.02	--	0.02
6	CT-17	F-CT-17	46307	1.53	1.53	3.13		1.60	--	1.60
7	CT-18	F-CT-18	46307	1.18	1.18	2.39		1.21	--	1.21
8	DOCK-TO	DOCK-TO	22052	0.00	0.00	1.37		1.37		1.37
9	Boiler 12	Boiler 12	46426	0.00	0.00	21.67		21.67		21.67
								Page Subtotal[9]	--	**26.42**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

[10] A negative B-A Difference indicates a new proposed emission rate lower than the current allowable, therefore the Project Increase is set equal to 0.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]:	**PM10**	**Permit:**	**46307, 46426, 22052**
Baseline Period:	**2017** to **2018**		

					A	B				
Affected or Modified Facilities[2]			**Permit No.**	**Actual Emissions[3]**	**Baseline Emissions[4]**	**Proposed Emissions[5]**	**Projected Actual Emissions**	**Difference (B-A)[6,10]**	**Correction[7]**	**Project Increase[8]**
	FIN	**EPN**								
1	CT-3	F-CT-3	46307	2.24	2.24	2.59		0.35	--	0.35
2	CT-7	F-CT-7	46307	0.34	0.34	0.34		0.00	--	0.00
3	CT-10	F-CT-10	46307	0.16	0.16	0.11		-0.05	--	0.00
4	CT-11	F-CT-11	46307	0.04	0.04	0.04		0.00	--	0.00
5	CT-14	F-CT-14	46307	0.25	0.25	0.25		0.00	--	0.00
6	CT-17	F-CT-17	46307	1.23	1.23	2.32		1.09	--	1.09
7	CT-18	F-CT-18	46307	0.92	0.92	1.77		0.85	--	0.85
8	DOCK-TO	DOCK-TO	22052	0.00	0.00	1.37		1.37		1.37
9	Boiler 12	Boiler 12	46426	0.00	0.00	21.67		21.67		21.67
								Page Subtotal[9]	--	**25.34**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

[10] A negative B-A Difference indicates a new proposed emission rate lower than the current allowable, therefore the Project Increase is set equal to 0.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: $PM_{2.5}$	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

	Affected or Modified Facilities[2]		Permit No.	Actual Emissions[3]	A Baseline Emissions[4]	B Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6]	Correction[7]	Project Increase[8]
	FIN	EPN								
1	CT-3	F-CT-3	46307	0.00	0.00	0.01		0.01	--	0.01
2	CT-7	F-CT-7	46307	0.01	0.01	0.01		0.00	--	0.00
3	CT-10	F-CT-10	46307	0.00	0.00	3.42E-04		0.00	--	3.42E-04
4	CT-11	F-CT-11	46307	0.00	0.00	0.01		0.01	--	0.01
5	CT-14	F-CT-14	46307	0.00	0.00	0.01		0.01	--	0.01
6	CT-17	F-CT-17	46307	0.00	0.00	0.01		0.01	--	0.01
7	CT-18	F-CT-18	46307	0.00	0.00	0.01		0.01	--	0.01
8	DOCK-TO	DOCK-TO	22052	0.00	0.00	1.37		1.37		1.37
9	Boiler 12	Boiler 12	46426	0.00	0.00	21.67		21.67		21.67
								Page Subtotal[9]	--	**23.08**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

TCEQ

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: VOC	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

	Affected or Modified Facilities[2]		Permit No.	Actual Emissions[3]	A Baseline Emissions[4]	B Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6, 10]	Correction[7]	Project Increase[8]
	FIN	EPN[11]								
1	EP-5	EP-5	46307/22052	14.00	14.00	36.85		22.85	--	22.85
2	CT-3	F-CT-3	46307	5.02	5.02	9.99		4.98	--	4.98
3	CT-7	F-CT-7	46307	0.38	0.38	2.63		2.25	--	2.25
4	CT-10	F-CT-10	46307	0.22	0.22	0.92		0.70	--	0.70
5	CT-11	F-CT-11	46307	0.00	0.00	0.15		0.15	--	0.15
6	CT-14	F-CT-14	46307	0.47	0.47	3.86		3.39	--	3.39
7	CT-17	F-CT-17	46307	2.23	2.23	8.94		6.71	--	6.71
8	CT-18	F-CT-18	46307	1.64	1.64	6.84		5.20	--	5.20
9	TRUCK-RACK	F-TTR	46307	0.12	0.12	0.26		0.14	--	0.14
10	LOAD-GRP	LOAD-GRP	46307	1.94	1.94	1.94		0.00	--	0.00
11	T-P1WW1	T-P1WW1	46307	0.00	0.00	0.01		0.01	--	0.01
12	T-P1WW2	T-P1WW2	46307	0.00	0.00	0.01		0.01	--	0.01
13	T-P2WW1	T-P2WW1	46307	0.00	0.00	0.01		0.01	--	0.01
14	T-31	T-31	46307	0.33	0.33	0.62		0.29	--	0.29
15	T-32	T-32	46307	0.32	0.32	0.32		0.00	--	0.00
16	T-33	T-33	46307	0.01	0.01	0.01		0.00	--	0.00
17	T-34	T-34	46307	0.02	0.02	0.28		0.26	--	0.26
18	T-36	T-36	46307	0.12	0.12	0.23		0.12	--	0.12
19	T-37	T-37	46307	0.09	0.09	0.23		0.14	--	0.14
20	T-69-1	T-69-1	46307	0.00	0.00	0.01		0.01	--	0.01
21	T-71	T-71	46307	0.71	0.71	0.91		0.20	--	0.20
22	T-72	T-72	46307	0.41	0.41	0.84		0.44	--	0.44
23	T-73	T-73	46307	1.41	1.41	1.41		0.00	--	0.00
24	T-74	T-74	46307	1.41	1.41	1.41		0.00	--	0.00
25	T-77	T-77	46307	0.23	0.23	0.28		0.05	--	0.05
26	T-78	T-78	46307	0.23	0.23	0.28		0.05	--	0.05
27	T-79	T-79	46307	0.08	0.08	0.29		0.21	--	0.21
28	T-80	T-80	46307	0.13	0.13	1.98		1.85	--	1.85
29	T-81	T-81	46307	0.06	0.06	0.01		-0.05	--	0.00
30	T-82	T-82	46307	0.14	0.14	0.88		0.74	--	0.74

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: VOC	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

				A	B				
Affected or Modified Facilities[2]			Permit No.	Actual Emissions[3]	Baseline Emissions[4]	Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6, 10]	Correction[7]	Project Increase[8]
	FIN	EPN[11]								
								Page Subtotal[9]	--	50.76

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: VOC	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

					A	B				
Affected or Modified Facilities[2]			Permit No.	Actual Emissions[3]	Baseline Emissions[4]	Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6, 10]	Correction[7]	Project Increase[8]
	FIN	EPN[11]								
31	T-84	T-84	46307	0.59	0.59	0.59		0.00	--	0.00
32	T-85	T-85	46307	0.01	0.01	0.01		0.00	--	0.00
33	T-86	T-86	46307	0.04	0.04	0.01		-0.03	--	0.00
34	TT-103	T-103	46307	1.23	1.23	1.35		0.11	--	0.11
35	T-111	T-111	46307	0.00	0.00	0.01		0.01	--	0.01
36	T-112	T-112	46307	0.00	0.00	0.01		0.01	--	0.01
37	TT-114	T-114	46307	1.17	1.17	1.17		0.00	--	0.00
38	TT-115	T-115	46307	1.17	1.17	1.17		0.00	--	0.00
39	TNK-GRP	TNK-GRP	46307	1.34	1.34	1.34		0.00	--	0.00
40	T-155	T-155	46307	0.00	0.00	0.01		0.01	--	0.01
41	1F-511	1F-511	46307	0.00	0.00	0.01		0.01	--	0.01
42	2F26	2F26	46307	0.00	0.00	0.01		0.01	--	0.01
43	4F14	4F14	46307	0.00	0.00	0.01		0.01	--	0.01
44	5F3	5F3	46307	0.00	0.00	0.01		0.01	--	0.01
45	OIL SEP	F-10A	46307	0.00	0.00	0.80		0.80	--	0.80
46	WW-IDS	WW-IDS	46307	1.92	1.92	3.84		1.92	--	1.92
47	WW-PN	WW-PN	46307	2.84	2.84	6.54		3.70	--	3.70
48	01027	C-5	22052	1.23	1.23	0.21		-1.02	--	0.00
49	T-87	T-87	22052	0.14	0.14	0.60		0.46	--	0.46
50	FUG-BD-V	FUG-BD-V	46307	0.00	0.00	1.18		1.18	--	1.18
51	FUG-BD-D	FUG-BD-D	22052	0.00	0.00	0.12		0.12	--	0.12
52	TK-2D6	TK-2D6	46307	0.00	0.00	1.16		1.16	--	1.16
53	MSS-FLR	MSS-FLR	46307	0.00	0.00	0.02		0.02	--	0.02
54	MSS-BD	MSS-BD	46307	0.00	0.00	0.89		0.89	--	0.89
55	DOCK-TO	DOCK-TO	22052	0.00	0.00	1.84		1.84	--	1.84
56	Boiler 12	Boiler 12	46426	0.00	0.00	8.96		8.96	--	8.96
								Page Subtotal[9]	--	**21.24**
								Total	--	**71.99**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: VOC	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

				A	B				
Affected or Modified Facilities[2]			Permit No.	Actual Emissions[3]	Baseline Emissions[4]	Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6, 10]	Correction[7]	Project Increase[8]
	FIN	EPN[11]								

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

[10] A negative B-A Difference indicates a new proposed emission rate lower than the current allowable, therefore the Project Increase is set equal to 0.

[11] Caps: EPN LOAD-GRP includes the following EPNS: E-PIBTT, E-PIBTC, E-PIB1RC1, E-PIB1RC2, E-PIB2RC1, E-PIB2RC2, E-PIB2TT1 and E-PIB2TT2.
EPN TNK-GRP includes the following EPNS: T-117, T-118, T-119, T-204, T-205, and T206.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: SO_2	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

					A	B				
Affected or Modified Facilities[2]			Permit No.	Actual Emissions[3]	Baseline Emissions[4]	Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6]	Correction[7]	Project Increase[8]
	FIN	EPN								
1	EP-5	EP-5	46307/22052	0.01	0.01	6.08E-06		-0.01		0.00
2	MSS-FLR	MSS-FLR	46307	0.00	0.00	0.00		0.00		0.00
3	DOCK-TO	DOCK-TO	22052	0.00	0.00	0.08		0.08		0.08
4	Boiler 12	Boiler 12	46426	0.00	0.00	3.26		3.26		3.26
								Page Subtotal[9]		**3.34**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request. Actual emissions are capped at allowable limits.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

TABLE 2F
PROJECT EMISSION INCREASE

Pollutant[1]: GHG	Permit: 46307, 46426, 22052
Baseline Period: 2017 to 2018	

					A	B				
Affected or Modified Facilities[2]			Permit No.	Actual Emissions[3]	Baseline Emissions[4]	Proposed Emissions[5]	Projected Actual Emissions	Difference (B-A)[6]	Correction[7]	Project Increase[8]
	FIN	EPN								
1	MSS-FLR	MSS-FLR	46307	0.00	0.00	6.67		6.67	--	6.67
2	DOCK-TO	DOCK-TO	22052	0.00	0.00	6,754		6753.91	--	6753.91
3	Boiler 12	Boiler 12	46426	0.00	0.00	267,734		267733.66	--	267733.66
								Page Subtotal[9]		**274,494**

[1] Individual Table 2Fs should be used to summarize the project emission increase for each criteria pollutant.

[2] Emission Point Number as designated in NSR Permit or Emissions Inventory.

[3] All records and calculations for these values must be available upon request.

[4] Correct actual emissions for currently applicable rule or permit requirements, and periods of non-compliance. These corrections, as well as any MSS previously demonstrated under 30 TAC 101, should be explained in the Table 2F supplement.

[5] If projected actual emission is used it must be noted in the next column and the basis for the projection identified in the Table 2F supplement.

[6] Proposed Emissions (column B) minus Baseline Emissions (column A).

[7] Correction made to emission increase for what portion could have been accommodated during the baseline period. The justification and basis for this estimate must be provided in the Table 2F supplement.

[8] Obtained by subtracting the correction from the difference. Must be a positive number.

[9] Sum all values for this page.

TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group LLC	
Permit Application Number: 46307, 46426, 22052	**Criteria Pollutant: NOX**

Project Date[2]		Facility at Which Emission Change Occurred[3]		Permit No.	Project Name or Activity	Baseline Period (years)	A Proposed Emissions (tons/year)[4]	B Baseline Emissions (tons/year)[5]	Difference (A-B)[6]	Creditable Decrease or Increase[7]
		FIN	EPN							
	3/13/2015	Various	EP-5	PBR 129453	New POLYISOBUTYLENE 3 (PIB-3) UNIT	N/A	0.02	0.00	0.02	0.02
	7/8/2015	Boiler 10	Boiler 10	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	55.50	28.47	27.03	27.03
	7/8/2015	Boiler 11	Boiler 11	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	55.50	29.12	26.38	26.38
	1/25/2018	TEMP-FLR	TEMP-FLR	Standard Permit 149663	TEMPORARY FLARE PROJECT	N/A	3.08	0.00	3.08	3.08
	3/14/2018	Various	EB-1B-505	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	76.87	31.13	45.74	45.74
	3/14/2018	Various	EB-1B-2501	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	12.88	7.38	5.50	5.50
	1/30/2019	Boiler 10 or Boiler 11	Boiler 10 or Boiler 11	PBR 154654	Initial PBR for degassing railcars prior to maintenance activities	N/A	0.43	0.00	0.43	0.43
	TBD	BLR-9	EP-H9	NSR 46426	BD Unit Amendment	2017-2018	0.00	398.56	-398.56	-398.56
Summary of Contemporaneous Changes				Contemporaneous Period:	**1/1/2015**	to	**1/1/2020**		**Total**	**-290.38**

[1] Individual Table 3Fs should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

[2] The permit issuance date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

[3] Emission Point No. as designated in NSR Permit or Emissions Inventory.

[4] All records and calculations for these values must be available upon request.

[5] All records and calculations for these values must be available upon request.

[6] Proposed (column A) - Baseline (column B).

[7] If portion of the decrease not creditable, enter creditable amount.

[8] Sum all values for this page.

TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group LLC	
Permit Application Number: 46307, 46426, 22052	**Criteria Pollutant: PM**

Project Date[2]		**Facility at Which Emission Change Occurred**[3]		**Permit No.**	**Project Name or Activity**	**Baseline Period (years)**	**A** Proposed Emissions (tons/year)[4]	**B** Baseline Emissions (tons/year)[5]	**Difference (A-B)**[6]	**Creditable Decrease or Increase**[7]
		FIN	**EPN**							
	3/13/2015	E-PIB3CTWR	E-PIB3CTWR	PBR 129453	New POLYISOBUTYLENE 3 (PIB-3) UNIT	N/A	0.37	0.00	0.37	0.37
	7/8/2015	Boiler 10	Boiler 10	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	20.7	12.96	7.74	7.74
	7/8/2015	Boiler 11	Boiler 11	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	20.7	12.95	7.75	7.75
	2/17/2016	CT-17	F-CT-17	PBR 138859	Cooling Tower CT-17 and CT-18 Rebuild/Replacement	N/A	1.56	0.00	1.56	1.56
	2/17/2016	CT-18	F-CT-18	PBR 138859	Cooling Tower CT-17 and CT-18 Rebuild/Replacement	N/A	1.2	0.00	1.20	1.20
	5/23/2017	CT-14	F-CT-14	PBR 146289	Shutdown Cooling Tower 14	2014-2015	0	0.56	-0.56	-0.56
	5/23/2017	CT-14	F-CT-14	PBR 146289	Authorized additional service of MeOH rich water in tanks T-73 and T-74 using 106.261 and authorized replacing cooling tower F-CT-14 under 106.371	N/A	0.34	0.00	0.34	0.34
	1/16/2018	CT-14	F-CT-14	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0	Included above in PBR 146289		
	1/16/2018	CT-17	F-CT-17	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0	Included above in PBR 138859		
	1/16/2018	CT-18	F-CT-18	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0	Included above in PBR 138859		
	3/14/2018	Various	EB-1B-505	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	29	9.00	20.00	20.00
	3/14/2018	Various	EB-1B-2501	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	3.2	1.83	1.37	1.37
	1/30/2019	Boiler 10 or Boiler 11	Boiler 10 or Boiler 11	PBR 154654	Initial PBR for degassing railcars prior to maintenance activities	N/A	0.16	0.00	0.16	0.16
	TBD	BLR-9	EP-H9	NSR 46426	BD Unit Amendment	2011-2012	0	15.08	-15.08	-15.08
Summary of Contemporaneous Changes		**Contemporaneous Period:**		**1/1/2015**		to	**1/1/2020**		**Total**	**24.8**

[1] Individual Table 3Fs should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

[2] The permit issuance date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

[3] Emission Point No. as designated in NSR Permit or Emissions Inventory.

[4] All records and calculations for these values must be available upon request.

[5] All records and calculations for these values must be available upon request.

[6] Proposed (column A) - Baseline (column B).

[7] If portion of the decrease not creditable, enter creditable amount.

[8] Sum all values for this page.

TCEQ

TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group LLC

Permit Application Number: 46307, 46426, 22052 | **Criteria Pollutant: PM10**

Project Date[2]	Facility at Which Emission Change Occurred[3]		Permit No.	Project Name or Activity	Baseline Period (years)	A Proposed Emissions (tons/year)[4]	B Baseline Emissions (tons/year)[5]	Difference (A-B)[6]	Creditable Decrease or Increase[7]
	FIN	EPN							
3/13/2015	E-PIB3CTWR	E-PIB3CTWR	PBR 129453	New POLYISOBUTYLENE 3 (PIB-3) UNIT	N/A	0.24	0.00	0.24	0.24
7/8/2015	Boiler 10	Boiler 10	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	20.7	12.96	7.74	7.74
7/8/2015	Boiler 11	Boiler 11	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	20.7	12.95	7.75	7.75
2/17/2016	CT-17	F-CT-17	PBR 138859	Cooling Tower CT-17 and CT-18 Rebuild/Replacement	N/A	1.16	0.00	1.16	1.16
2/17/2016	CT-18	F-CT-18	PBR 138859	Cooling Tower CT-17 and CT-18 Rebuild/Replacement	N/A	0.89	0.00	0.89	0.89
5/23/2017	CT-14	F-CT-14	PBR 146289	Shutdown Cooling Tower 14	2014-2015	0	0.42	-0.42	-0.42
5/23/2017	CT-14	F-CT-14	PBR 146289	Authorized additional service of MeOH rich water in tanks T-73 and T-74 using 106.261 and authorized replacing cooling tower F-CT-14 under 106.371	N/A	0.25	0.00	0.25	0.25
1/16/2018	CT-14	F-CT-14	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0	Included above in PBR 146289		
1/16/2018	CT-17	F-CT-17	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0	Included above in PBR 138859		
1/16/2018	CT-18	F-CT-18	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0	Included above in PBR 138859		
3/14/2018	Various	EB-1B-505	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	29	9.00	20.00	20.00
3/14/2018	Various	EB-1B-2501	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	3.2	1.83	1.37	1.37
1/30/2019	Boiler 10 or Boiler 11	Boiler 10 or Boiler 11	PBR 154654	Initial PBR for degassing railcars prior to maintenance activities	N/A	0.16	0.00	0.16	0.16
TBD	BLR-9	EP-H9	NSR 46426	BD Unit Amendment	2011-2012	0	15.08	-15.08	-15.08
Summary of Contemporaneous Changes		**Contemporaneous Period:**		**1/1/2015**	to	**1/1/2020**		**Total**	**24.0**

[1] Individual Table 3Fs should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

[2] The permit issuance date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

[3] Emission Point No. as designated in NSR Permit or Emissions Inventory.

[4] All records and calculations for these values must be available upon request.

[5] All records and calculations for these values must be available upon request.

[6] Proposed (column A) - Baseline (column B).

[7] If portion of the decrease not creditable, enter creditable amount.

[8] Sum all values for this page.

TCEQ

TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES

Company: TPC Group LLC
Permit Application Number: 46307, 46426, 22052
Criteria Pollutant: PM2.5

Project Date[2]	Facility at Which Emission Change Occurred[3]		Permit No.	Project Name or Activity	Baseline Period (years)	A Proposed Emissions (tons/year)[4]	B Baseline Emissions (tons/year)[5]	Difference (A-B)[6]	Creditable Decrease or Increase[7]
	FIN	EPN							
3/13/2015	E-PIB3CTWR	E-PIB3CTWR	PBR 129453	New POLYISOBUTYLENE 3 (PIB-3) UNIT	N/A	1.00E-03	0	1.00E-03	1.00E-03
7/8/2015	Boiler 10	Boiler 10	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	20.7	12.96	7.74	7.74
7/8/2015	Boiler 11	Boiler 11	NSR 46426	Renewal and authorized VAU, DH2, and plant offgas for Boilers 10 and 11, and added a VOC cap for Boilers 10 and 11	2010-2011	20.7	12.95	7.75	7.75
2/17/2016	CT-17	F-CT-17	PBR 138859	Cooling Tower CT-17 and CT-18 Rebuild/Replacement	N/A	0.01	0	0.01	0.01
2/17/2016	CT-18	F-CT-18	PBR 138859	Cooling Tower CT-17 and CT-18 Rebuild/Replacement	N/A	0.01	0	0.01	0.01
5/23/2017	CT-14	F-CT-14	PBR 146289	Shutdown Cooling Tower 14	N/A	0	0.01	-0.01	-0.01
5/23/2017	CT-14	F-CT-14	PBR 146289	Authorized additional service of MeOH rich water in tanks T-73 and T-74 using 106.261 and authorized replacing cooling tower F-CT-14 under 106.371	N/A	0.01	0.00	0.01	0.01
1/16/2018	CT-14	F-CT-14	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0.00	Included above in PBR 146289		
1/16/2018	CT-17	F-CT-17	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0.00	Included above in PBR 138859		
1/16/2018	CT-18	F-CT-18	NSR 46307	Incorporated F-CT-17 and F-CT-18 by consolidation, updated TNK-GRP, LOAD-GRP, and Wastewater tank physical data for emission calculations, and corrected annual loading throughput	N/A	0.00	Included above in PBR 138859		
3/14/2018	Various	EB-1B-505	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	29	9.00	20.00	20.00
3/14/2018	Various	EB-1B-2501	NSR 19806	Update emissions calculations for EB-1B-505 and modify EB-1B-2501 calculations due to change in firing rate	2015-2016	3.20	1.83	1.37	1.37
1/30/2019	Boiler 10 or Boiler 11	Boiler 10 or Boiler 11	PBR 154654	Initial PBR for degassing railcars prior to maintenance activities	N/A	0.16	0.00	0.16	0.16
TBD	BLR-9	EP-H9	NSR 46426	BD Unit Amendment	2011-2012	0.00	15.08	-15.08	-15.08
Summary of Contemporaneous Changes		**Contemporaneous Period:**		**1/1/2015**	to	**1/1/2020**		**Total**	**21.9**

[1] Individual Table 3Fs should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

[2] The permit issuance date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

[3] Emission Point No. as designated in NSR Permit or Emissions Inventory.

[4] All records and calculations for these values must be available upon request.

[5] All records and calculations for these values must be available upon request.

[6] Proposed (column A) - Baseline (column B).

[7] If portion of the decrease not creditable, enter creditable amount.

[8] Sum all values for this page.

TABLE 4F
DESCRIPTION OF CREDITABLE REDUCTIONS

Company Name: TPC Group LLC	
Contaminant: **NOx**	
Date Action Occurred: **Prior to start of construction or operation**	
SIC Code for this Source: **2869**	
Permit No.: **46307, 46426, 22052**	
For Creditable Reductions, verify each statement by checking all boxes:	
The reductions occurred within the contemporaneous period.	**X** YES NO
The reductions occurred at the same major stationary source.	**X** YES NO
The reductions have not been relied upon in issuing a previous federal permit.	**X** YES NO
The reductions have not been used as an offset in a previous nonattainment permit, and are not reserved in a permit condition for use as an offset.	**X** YES NO
As of the date of this application, the reductions are not required by any rule pursuant to the Texas SIP (30 TAC 111, 115, and 117).*	**X** YES NO
The reductions are federally enforceable.	**X** YES NO
The reductions are of the same qualitative significance.	**X** YES NO
Records for all facilities are available to demonstrate the baseline emissions.	**X** YES NO

* - required only for nonattainment applicability analysis.

Please give a complete description of project. Provide all EPNs affected by this project:

Boiler 9 (EPN EP-H9) authorized under NSR Permit No 46426 will be shutdown, resuling in creditable NOx decreases.

Table 4N
Initial Lowest Achievable Emission Rate (LAER) Determination

Complete the items below and attach any supplemental information.	
Company Name: TPC Group LLC	
Source Type/Name: Houston Plant	
Location/Address: 8600 Park Place Blvd., Houston, TX 77017	
Estimated Start-up Date: February 2020	
RACT\BACT\LAER Clearinghouse:	
Search Date: October 2019	
Report Attached:	☒ Yes ☐ No
Agencies Contacted:	
EPA's RBLC Database	
CA's Clearinghouse	
TCEQ Tier I BACT	
Bay Area Air Quality Management District (BAAQMD) Guidance	
Other Control Researched:	
South Coast Air Quality Management District (SCAQMD) Guidance	
Control Technology Proposed:	
See Section 8	

Table 6N
Alternative Site Analysis for Texas Nonattainment New Source Review

Completion of this table demonstrates that the requirements of Section 173(a)(5) of the Federal Clean Air Act have been satisfied. If the "No" box is checked for any question other than Question 1, the requirements of that section of the Federal Clean Air Act have not been fulfilled.

1. Is the facility located within a Texas Enterprise Zone? Provide a map showing site location with respect to enterprise zone. ☒ Yes ☐ No

   If "Yes," a signed table 9N must accompany this form to certify the statement.
   If "No," further alternate site analysis is required. *(continue)*

2. Have the potential and real adverse environmental effects of the proposed project been avoided to the maximum extent possible? That is, has lowest achievable emission rate (LAER) been applied and offsets provided? ☒ Yes ☐ No

3. Do the social and economic benefits of the proposed project outweigh the environmental impact of the project? ☒ Yes ☐ No

   If "Yes," this project as proposed will create what number of new jobs? _____

   An emission offset will be provided in the ratio of 1.2 to 1 that will actually decrease the environmental impacts in the area due to the emission of the pollutant of concern.

4. Have alternative projects which would offer more protection to the environment than the proposed facility without unduly curtailing nonenvironmental benefits been considered? ☒ Yes ☐ No

   If "Yes," an emission offset will be provided in the ratio of 1.2 to 1 that will actually decrease the environmental impacts in the area due to the emission of the pollutant of concern,

   ☒ The market demands construction of this project, or

   ☐ Other (please explain):

5. Have alternate sites been considered which would offer more protection to the environment than the project without unduly curtailing nonenvironmental benefits? ☒ Yes ☐ No

   If "Yes," an emission offset will be provided in the ratio of 1.2 to 1 that will actually decrease the environmental impacts in the area due to the emission of the pollutant of concern, and:

   ☒ The existing infrastructure encourages location of this project at the proposed site.

   ☐ Other (please explain):

Table 9N
Signature Verification

Check the Most Appropriate Answer	
The appropriate company official (owner, plant manager, president, vice president, or environmental director) must initial all applicable statements.	
All net contemporaneous changes on Table 1F entitled "Air Quality Application Supplement" are accurate and all reductions used in the calculations of all net contemporaneous changes are creditable.	■ Yes ☐ No ☐ N/A
All representations on Table 3F entitled "Project Contemporaneous Changes" are accurate, all reductions are creditable, and no reductions included on Table 3F "Project Contemporaneous Changes" have been used for offsets.	■ Yes ☐ No ☐ N/A
The contemporaneous changes identified in Table 4F entitled "Description of Creditable Reductions" are accurate and have not been used as offsets. All reductions claimed on Table 4F are creditable as described by the checked boxes and these reductions have not been used as offsets for any other project.	■ Yes ☐ No ☐ N/A
The following signature certifies that the control technology proposed and represented on Table 4N entitled "Initial Lowest Achievable Emission Rate (LAER) Determination" meets or exceeds LAER.	■ Yes ☐ No ☐ N/A
Questions 1-5 on Table 6N entitled "Alternate Site Analysis" have been answered truthfully to the best of my ability.	■ Yes ☐ No ☐ N/A

I, _____
(Name – please print or type)

_____
(Title)

state that the above representations and representations made on the accompanying tables are true and correct to the best of my knowledge and belief. I am also representing that those statements that are not initialed do not apply to this application.

_____
(Original Signature)
(Must be in Ink)

_____
(Date)

APPENDIX C: LAER/BACT SEARCH RESULTS

Process Vents
Storage Tanks
Cooling Towers

RBLC Search Results (VOC - Process Vents)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	BOILERS (94-43 & 94-45)	11.39	REFINERY FUEL GAS	354	MMBTU/HEA	Volatile Organic Compounds (VOC)		1.91	LB/H
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	ARU FLARE (2008-36)	50.008	PROCESS FUEL GAS			Volatile Organic Compounds (VOC)	COMPLY WITH 40 CFR 60 SUBPART A	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	HEATERS/REBOILERS	13.39	REFINERY FUEL GAS			Volatile Organic Compounds (VOC)	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	HEATERS (2008-1 - 2008-9)	12.39	PROCESS FUEL GAS			Volatile Organic Compounds (VOC)	COMPLY WITH 40 CFR 60 SUBPARTS NNN AND RRR	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	MVR THERMAL OXIDIZER NO. 2 (2008-38)	50.008	REFINERY FUEL GAS	200	MMBTU/H	Volatile Organic Compounds (VOC)	COMPLY WITH 40 CFR 61 SUBPART BB	5.4	LB/H
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	HEATERS (94-21 & 94-29)	13.39	REFINERY FUEL GAS			Volatile Organic Compounds (VOC)	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	CPF HEATER H-39-03 & H-39-02 (94-28 & 94-30)	13.39	REFINERY FUEL GAS			Volatile Organic Compounds (VOC)	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0.0054	LB/MMBTU
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	BOILERS (2008-10, 2008-11, 2008-40)	11.39	REFINERY FUEL GAS	715	MMBTU/HEA	Volatile Organic Compounds (VOC)	COMPLY WITH 40 CFR 60 SUBPARTS NNN AND RRR	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	DHT HEATERS (4-81, 5-81)	13.39	REFINERY FUEL GAS	70	MMBTU/HEA	Volatile Organic Compounds (VOC)	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	HEATER F-72-703 (7-81)	11.39	REFINERY FUEL GAS	633	MMBTU/H	Volatile Organic Compounds (VOC)	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0	
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	THERMAL OXIDIZERS (2008-32, 2008-33, 2008-34)	50.008	PROCESS FUEL GAS	15	MMBTU/HEA	Volatile Organic Compounds (VOC)	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0	
LA-0290	LAKE CHARLES CHEMICAL COMPLEX GTL LAB-2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Hot Oil Heater (EQT 623)	12.39	Process Gas	171	MMBTU/HR	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	1.13	LB/HR
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Process Heaters (EQT 690, 691, 692, 751, 752, & 753)	11.39	Process Gas	424.8	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	2.32	LB/H
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Process Heater (EQT 702)	13.39	Process Gas	73.8	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	0.42	LB/HR

LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Base Oils DW Reactor Feed Heater (EQT 776)	13.39	Process Gas	31	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	0.19	LB/HR
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Base Oils Light Vacuum Feed Heater (EQT 777)	13.39	Process Gas	71.2	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	0.41	LB/HR
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Base Oils Heavy Vacuum Feed Heater (EQT 778)	13.39	Process Gas	10	MM BTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	0.08	LB/HR
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	HC Reactor Feed Heaters (EQT 736 & 754)	13.39	Process Gas	70.8	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	0.41	LB/HR
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Fractionator Feed Heaters (EQT 737 & 774)	12.39	Process Gas	248.7	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	1.37	LB/HR
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	DW Reactor Feed Heaters (EQT 738 & 775)	13.39	Process Gas	56.8	MMBTU/H	Volatile Organic Compounds (VOC)	Good combustion practices and the tune-up provisions of 40 CFR 63 Subpart DDDDD	0.33	LB/HR
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Hot Oil Heater (EQT 772)	13.39	Process Gas	40	MM Btu/hr	Volatile Organic Compounds (VOC)	Good combustion practices and compliance with the applicable provisions of 40 CFR 63 Subpart DDDDD	0.21	LB/HR
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Utility Steam Boiler Nos. 1-3 (EQTs 967, 968, & 969)	11.39	Process Gas	662	MM BTU/HR	Volatile Organic Compounds (VOC)	Good combustion practices and compliance with the applicable provisions of 40 CFR 63 Subpart DDDDD	3.63	LB/HR
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Furnace Nos. 1-8 (EQTs 971, 972, 973, 974, 975, 976, 977, & 978)	11.39	Process Gas	654	MM BTU/HR	Volatile Organic Compounds (VOC)	Good combustion practices and compliance with the applicable provisions of 40 CFR 63 Subpart DDDDD	4.91	LB/HR
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Firewater Pump Nos. 1-3 (EQTs 997, 998, & 999)	17.21	Diesel	500	HP	Volatile Organic Compounds (VOC)	Compliance with 40 CFR 60 Subpart IIII and operating the engine in accordance with the engine manufacturerâ€™s instructions and/or written procedures (consistent with safe operation) designed to maximize combustion efficiency and minimize fuel usage	0.1	LB/HR
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Process Heat Boilers B-910A & B-910B (EQTs 1008 & 1009)	13.39	Process Gas	78	MM BTU/HR	Volatile Organic Compounds (VOC)	Good combustion practices and compliance with the applicable provisions of 40 CFR 63 Subpart DDDDD	0.42	LB/HR

LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Reactor Feed Heater (EQT 1160)	13.39	Process Gas	18	MM BTU/HR	Volatile Organic Compounds (VOC)	Good combustion practices and compliance with the applicable provisions of 40 CFR 63 Subpart DDDDD	0.1	LB/HR
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Hot Oil Heater (EQT 1161)	12.39	Process Gas	240	MM BTU/HR	Volatile Organic Compounds (VOC)	Good combustion practices and compliance with the applicable provisions of 40 CFR 63 Subpart DDDDD	1.29	LB/HR
TX-0811	LINEAR ALPHA OLEFINS PLANT	INEOS OLIGOMERS USA LLC	136130 AND N250	Industrial-Sized Furnaces, Natural Gas-fired	12.31	natural gas	217	MM BTU / H	Volatile Organic Compounds (VOC)	Good combustion practices	2.15	T/YR
TX-0813	ODESSA PETROCHEMICAL PLANT	REXTAC, LLC	16963, PSDTX1478, GHGPSDTX148	Boilers	12.31	natural gas	223	MMBTU/H	Volatile Organic Compounds (VOC)	Best combustion practices	0.0005	LB/MMBTU
TX-0813	ODESSA PETROCHEMICAL PLANT	REXTAC, LLC	16963, PSDTX1478, GHGPSDTX148	small Boiler	13.31	natural gas	39.9	MMBtu/hr	Volatile Organic Compounds (VOC)	best combustion practices	0.0005	MMBTU/HR
TX-0815	PORT ARTHUR ETHANE SIDE CRACKER	TOTAL PETROCHEMICALS & REFINING USA, INC.	122353, PSDTX1426, GHGPSDTX114	Pyrolysis Furnaces	11.31	NATURAL GAS	1000	kT / YR	Volatile Organic Compounds (VOC)	good combustion practices	24.68	T/YR
TX-0823	LYONDELL CHEMICAL BAYPORT CHOATE PLANT	LYONDELL CHEMICAL COMPANY	137789 AND N244	Reactor Furnaces	64.001	NATURAL GAS	4131	MM LB/YR	Volatile Organic Compounds (VOC)	FIRED WITH NATURAL GAS	0.013	LB/MMBTU
TX-0823	LYONDELL CHEMICAL BAYPORT CHOATE PLANT	LYONDELL CHEMICAL COMPANY	137789 AND N244	Emergency Diesel Engines	64.999	DIESEL	0		Volatile Organic Compounds (VOC)	Good combustion practice; compliance with NSPS IIII, fired with ULSD	0.01	T/YR
TX-0835	CHANNELVIEW TERMINAL	TARGA	N262	PROCESS VENTS TO FLARE	19.33	NATURAL GAS	10410100	SCF/YR	Volatile Organic Compounds (VOC)	The flare designed to meet 40 CFR Â§60.18 with a VOC DRE of 98% for compounds with four carbons and more, and 99% for compounds with three or less. The flare has installed a continuous flow monitor and composition analyzer. Operation conditions and flaring of off-gas shall be re-evaluated every two-years.	0	
TX-0835	CHANNELVIEW TERMINAL	TARGA	N262	HOT OIL HEATER	19.8	NATURAL GAS	0		Volatile Organic Compounds (VOC)	The heater has a maximum heating capacity of less than 100 MMBtu. Good combustion practices will be used to reduce VOC including maintain proper air-to-fuel ratio, necessary residence time, temperature and turbulent. Fuel usage is monitored continuously.	0.002	LB/MMBTU
TX-0835	CHANNELVIEW TERMINAL	TARGA	N262	CRUDE PROCESS HEATERS	19.33	NATURAL GAS	100	MMBTU/HR	Volatile Organic Compounds (VOC)	GOOD COMBUSTION	0.0013	LB/MMBTU

TX-0849	MONT BELVIEU	TARGA MIDSTREAM SERVICES LLC	101616, PSDTX696M2, N214M1,	HOT OIL HEATERS	11.31	NATL GAS	0		Volatile Organic Compounds (VOC)	CLEAN NATL GAS	0	
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Elevated Flare	99.999	natural gas	0		Volatile Organic Compounds (VOC)	best combustion practices, natural gas supplemental fuel	0	
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Thermal Oxidizers	99.999	natural gas	0		Volatile Organic Compounds (VOC)	best combustion practices, natural gas supplemental fuel	0	
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Ethylene Plant Pyrolysis Furnace	64.001	blend gas	0		Volatile Organic Compounds (VOC)	good combustion practices and the use of gaseous fuel, process vents closed	0	
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Multi Point Ground Flare	99.999	natural gas	0		Volatile Organic Compounds (VOC)	best combustion practices, natural gas supplemental fuel	0	
*TX-0863	POLYETHYLENE 7 FACILITY	THE DOW CHEMICAL COMPANY	153106 AND N268	Furnace	13.9	natural gas	84.27	MMBTU/H	Volatile Organic Compounds (VOC)	Control of VOC in vent gas from pellet hoppers, blenders, and silos monitored with a continuous FID	0	
*TX-0864	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N266, PSDTX1542, GHGPSDTX183	Multi Point Ground Flare	19.31	natural gas	0		Volatile Organic Compounds (VOC)	good combustion practices	0	
*TX-0864	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N266, PSDTX1542, GHGPSDTX183	Elevated Flare	19.31	natural gas	0		Volatile Organic Compounds (VOC)	good combustion practices, design, natural gas fuel	0	
*TX-0864	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N266, PSDTX1542, GHGPSDTX183	Thermal Oxidizer	19.2	natural gas	0		Volatile Organic Compounds (VOC)	good combustion practices, design, natural gas fuel	0	
*TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N264, PSDTX1540, GHGPSDTX182	Process Heaters	19.6	natural gas, process gas	202	MMBtu/hr	Volatile Organic Compounds (VOC)	Good combustion practices, clean fuel	5.5	LB/MMSCF
*TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N264, PSDTX1540, GHGPSDTX182	PDH PROCESS VENTS	64.003	NATURAL GAS	0		Volatile Organic Compounds (VOC)	MULTIPOINT GROUND FLARE	0	
*TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N264, PSDTX1540, GHGPSDTX182	MULTIPOINT GROUND FLARE	19.31	NATURAL GAS	0		Volatile Organic Compounds (VOC)	Good combustion practices, proper design and operation	0	
*TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N264, PSDTX1540, GHGPSDTX182	MEROX PROCESS VENTS	64.003	NATURAL GAS	0		Volatile Organic Compounds (VOC)	ELEVATED FLARE	0	

*TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N264, PSDTX1540, GHGPSDTX182	MEROX ELEVATED FLARE	19.31	NATURAL GAS	0		Volatile Organic Compounds (VOC)	Good combustion practices, proper design and operation	0	

RBLC Search Results (VOC - Storage Tanks)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
FL-0322	SWEET SORGHUM-TO-ETHANOL ADVANCED BIOREFINERY	SOUTHEAST RENEWABLE FUELS (SRF), LLC	PSD-FL-412 (0510032-001-AC)	Storage Tanks	64.004	ethanol	23.01	MMGAL/12-MO	Volatile Organic Compounds (VOC)	Emissions of VOC from the Blending and Storage tanks will be controlled by the proper construction of the tanks per 40 CFR 60.110b(a)(2) which requires internal floating roofs in the tanks or the equivalent.	0	
LA-0277	COMONIMER-1 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-814	Storage Tanks (7 units)	64.004		0		Volatile Organic Compounds (VOC)	Internal Floating roofs (IFR)	0	
LA-0277	COMONIMER-1 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-814	C10+ Storage Tank T12-917	64.004		88128	gallons	Volatile Organic Compounds (VOC)	Submerged fill pipe	0	
LA-0290	LAKE CHARLES CHEMICAL COMPLEX GTL LAB-2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Storage Tank NT-1 (EQT 625)	64.004		58	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.66	TPY
LA-0290	LAKE CHARLES CHEMICAL COMPLEX GTL LAB-2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Storage Tank NT-3 (EQT 626)	64.004		34.11	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.54	TPY
LA-0290	LAKE CHARLES CHEMICAL COMPLEX GTL LAB-2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Storage Tank NT-4 (EQT 627)	64.004		58.09	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.66	TPY
LA-0290	LAKE CHARLES CHEMICAL COMPLEX GTL LAB-2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Storage Tank NT-7 (EQT 628)	64.004		3.39	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.15	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	GTLBO XLN Grade Finished Product Tanks (EQT 789 & 790)	64.004		45.3	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.06	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	GTLBO LN Grade Finished Product Tanks (EQT 791 & 792)	64.004		55.3	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.34	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	GTLBO MN Grade Finished Product Tanks (EQT 793 & 794)	64.004		27.7	MM GALS	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.59	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	GTLBO HN Grade Finished Product Tanks (EQT 795 & 796)	64.004		24.9	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.52	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50R Prover Tanks (EQT 703 & 704)	64.004		230.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	5.86	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50R Storage Tank (EQT 705)	64.004		230.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	6.98	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60R Prover Tanks (EQT 706 & 707)	64.004		157.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	3.86	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60R Storage Tank (EQT 708)	64.004		157.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	4.84	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT70R Prover Tanks (EQT 709 & 710)	64.004		45.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.17	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT70R Storage Tank (EQT 711)	64.004		45.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.37	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT80R Prover Tanks (EQT 712 & 713)	64.004		94.6	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.32	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50H Prover Tanks (EQT 714 & 715)	64.004		238.6	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	5.85	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50H Storage Tank (EQT 716)	64.004		254.4	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	7.74	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60H Prover Tanks (EQT 717 & 718)	64.004		231.8	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	5.68	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60H Storage Tank (EQT 719)	64.004		254.4	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	7.16	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT70H Prover Tanks (EQT 720 & 721)	64.004		251.8	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	6.17	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50HD Prover Tanks (EQT 722 & 723)	64.004		95.7	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.36	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60HD Prover Tanks (EQT 724 & 725)	64.004		49.4	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.23	TPY

RBLC Search Results (VOC - Storage Tanks)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Wax Storage Tank (EQT 726)	64.004		5.3	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.23	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Product Storage Tank (EQT 727)	64.004		104.1	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.62	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Product Storage Tank (EQT 728)	64.004		10	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.41	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Wax Storage Tank (EQT 729)	64.004		228.6	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	6.16	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50 Non-Deoiled/Non HDT Wax Tank (EQT 741)	64.004		44	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	6.28	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50 HDT and Deoiled Wax Tank (EQT 742)	64.004		1.39	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.2	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50 HDT Deoiled Blended Wax Tank (EQT 743)	64.004		25.5	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.73	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60 HDT and Deoiled Wax Tank (EQT 746)	64.004		4.63	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	2.73	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT50 Emulsion Wax Tank (EQT 744)	64.004		57	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.66	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60 Non-Deoiled Wax Tank (EQT 745)	64.004		57	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.66	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT60 Blends Wax Tank (EQT 747)	64.004		2.31	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.33	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT70 Non-Deoiled/Non HDT Wax Tank (EQT 748)	64.004		4.63	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.66	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT70 HDT Wax Tank (EQT 749)	64.004		4.63	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.67	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	FT80 Non-Deoiled/Non HDT Wax Tank (EQT 750)	64.004		9.26	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	1.33	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Naphtha Storage Tanks (EQT 815, 816, & 817)	64.004		439	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal floating roof (IFR)	10.85	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	P/O Rundown Tanks (EQT 818, 819, 820, & 821)	64.004		202	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal floating roof (IFR)	0.57	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Statutory Storage Tank (EQT 826)	64.004		439	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal floating roof (IFR)	12.38	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Petroleum Wax Storage Tank (EQT 827)	64.004		79	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.76	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Fresh Amine Storage Tank (EQT 829)	64.004		79	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof; best maintenance practices consistent with Sasol's written plan developed pursuant to LAC 33:III.2113	0.004	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Process Licensor Methanol Tank Nos. 1 & 2 (EQT 797 & 798)	64.004		26.8	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal floating roof (IFR)	0.31	TPY
LA-0291	LAKE CHARLES CHEMICAL COMPLEX GTL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-778	Storage Tanks Routed to Flare	64.004		0		Volatile Organic Compounds (VOC)	Flare	0	
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isofol 12 Storage Tank (EQT 759)	64.004		6.3	MM GALS/YR	Volatile Organic Compounds (VOC)		2.02	TPY
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isofol 16 Storage Tank (EQT 760)	64.004		6.27	MM GALS/YR	Volatile Organic Compounds (VOC)		2.62	TPY
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isofol 20 Storage Tank (EQT 761)	64.004		6.26	MM GALS/YR	Volatile Organic Compounds (VOC)		3.22	TPY
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isofol 24 Storage Tank (EQT 762)	64.004		6.23	MM GALS/YR	Volatile Organic Compounds (VOC)		3.81	TPY

RBLC Search Results (VOC - Storage Tanks)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isofol 28 Storage Tank (EQT 763)	64.004		6.32	MM GALS/YR	Volatile Organic Compounds (VOC)		4.45	TPY
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isofol 32 Storage Tank (EQT 764)	64.004		6.4	MM GALS/YR	Volatile Organic Compounds (VOC)		3.56	TPY
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	External Alcohol Product Storage Tank (EQT 765)	64.004		6.4	MM GALS/YR	Volatile Organic Compounds (VOC)		2.02	TPY
LA-0298	LAKE CHARLES CHEMICAL COMPLEX GUERBET ALCOHOLS UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Guerbet Offspec Alcohol Storage Tanks (EQTs 766, 767, & 768)	64.004		11.04	MM GALS/YR	Volatile Organic Compounds (VOC)		1.23	TPY
LA-0299	LAKE CHARLES CHEMICAL COMPLEX ETHOXYLATION UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	#4 Product Storage Tanks (EQTs 1081 & 1082)	64.004		15	MM GALS/YR	Volatile Organic Compounds (VOC)		13.01	TPY
LA-0299	LAKE CHARLES CHEMICAL COMPLEX ETHOXYLATION UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Storage Tanks (EQTs 1091, 1092, 1093, & 1094)	64.004		5	MM GALS/YR	Volatile Organic Compounds (VOC)		10.94	TPY
LA-0299	LAKE CHARLES CHEMICAL COMPLEX ETHOXYLATION UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Product Storage Tanks (EQTs 1101 & 1102)	64.004		8.4	MM GALS/YR	Volatile Organic Compounds (VOC)		5.22	TPY
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Pressurized Tanks	64.004		0		Volatile Organic Compounds (VOC)	Maintain the working pressure sufficient at all times under normal operating conditions to prevent vapor or gas loss to the atmosphere	0	
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	LAC Tank (EQT 1110), Heavy Pygas (HAD) Tank (EQT 1111), and Pentane Drum (EQT 1113)	64.004		0		Volatile Organic Compounds (VOC)	Flare	0	
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Wash Oil Tank (EQT 1116) and Dimethyl Sulfide Tank (EQT 1117)	64.004		0		Volatile Organic Compounds (VOC)	Flare	0	
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Methanol/Propanol Storage Tank (EQT 984)	64.004		58824	GALS/YR	Volatile Organic Compounds (VOC)	Internal Floating Roof	0.16	TPY
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Methanol Storage Tank (EQT 986)	64.004		15000	GALS/YR	Volatile Organic Compounds (VOC)	Internal Floating Roof	0.12	TPY
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Wash Oil Tank (EQT 993)	64.004		393176	GALS/YR	Volatile Organic Compounds (VOC)	Internal Floating Roof	0.16	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	MEG Storage Tanks (EQTs 1015, 1016, & 1017)	64.004		181.44	MM GALS/YR	Volatile Organic Compounds (VOC)		0.67	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	DEG Storage Tanks (EQTs 1018 & 1019)	64.004		14.97	MM GALS/YR	Volatile Organic Compounds (VOC)		0.01	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	TEG Storage Tanks (EQTs 1020 & 1021)	64.004		792000	GALS/YR	Volatile Organic Compounds (VOC)		0.001	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	DEG Storage Tank (EQT 1022)	64.004		14.97	MM GALS/YR	Volatile Organic Compounds (VOC)		0.001	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Crude Glycol Storage Tank (EQT 1023)	64.004		181.44	MM GALS/YR	Volatile Organic Compounds (VOC)		0.4	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Crude Heavy Glycol Storage Tank (EQT 1024)	64.004		16.11	MM GALS/YR	Volatile Organic Compounds (VOC)		0.03	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	PEG Storage Tank (EQT 1025)	64.004		366000	GALS/YR	Volatile Organic Compounds (VOC)		0.001	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	MEG Rundown Storage Tanks (EQT 1026 & 1027)	64.004		181.44	MM GALS/YR	Volatile Organic Compounds (VOC)		0.18	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	DEG Rundown Storage Tanks (EQT 1028 & 1029)	64.004		14.97	MM GALS/YR	Volatile Organic Compounds (VOC)		0.003	TPY
LA-0302	LAKE CHARLES CHEMICAL COMPLEX EO/MEG UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	TEG Rundown Storage Tanks (EQT 1030 & 1031)	64.004		792000	GALS/YR	Volatile Organic Compounds (VOC)		0.001	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	SSO Storage Tank (EQT 139)	64.004		35	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal floating roof	1.03	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 173)	64.004		3.4	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal floating roof	0.26	TPY

RBLC Search Results (VOC - Storage Tanks)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Isopropanol/Slurry Tank (EQT 1163)	64.004		0		Volatile Organic Compounds (VOC)		0.1	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol/Hydrolysis Condensate/Slurry Tanks (EQTs 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, & 1176)	64.004		0		Volatile Organic Compounds (VOC)		0.25	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Growth Product Tanks (EQTs 1177 & 1180)	64.004		124.51	MM GALS/YR	Volatile Organic Compounds (VOC)		5.92	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Growth Product Tanks (EQTs 1178 & 1179)	64.004		126.55	MM GALS/YR	Volatile Organic Compounds (VOC)		4.5	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Hydrolysis Water Storage Tank (EQT 1181)	64.004		138.92	MM GALS/YR	Volatile Organic Compounds (VOC)		2.83	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Wet Crude Alcohol Storage Tank (EQT 1182)	64.004		291.16	MM GALS/YR	Volatile Organic Compounds (VOC)		6.81	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	HF 1000/LPA 140 Tank (EQT 1183)	64.004		25	MM GALS/YR	Volatile Organic Compounds (VOC)		1.4	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	TPT/LPA 140 Tank (EQT 1184)	64.004		170563	GALS/YR	Volatile Organic Compounds (VOC)		0.09	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C6 Alc A & B Tanks (EQTs 1185 & 1186)	64.004		21	MM GALS/YR	Volatile Organic Compounds (VOC)		3.42	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Light Pure Cut Tank (EQT 1187)	64.004		25	MM GALS/YR	Volatile Organic Compounds (VOC)		0.44	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C1214 Alcohol Tank (EQT 1188)	64.004		12.9	MM GALS/YR	Volatile Organic Compounds (VOC)		2.47	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C8 Pure Cut Tank (EQT 1189)	64.004		10	MM GALS/YR	Volatile Organic Compounds (VOC)		0.66	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C10 Pure Cut Tank (EQT 1190)	64.004		11	MM GALS/YR	Volatile Organic Compounds (VOC)		1.62	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C12 Pure Cut Tank (EQT 1191)	64.004		8	MM GALS/YR	Volatile Organic Compounds (VOC)		1.29	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C14 Pure Cut Tank (EQT 1192)	64.004		5	MM GALS/YR	Volatile Organic Compounds (VOC)		1.35	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C16 Pure Cut Tank (EQT 1193)	64.004		3	MM GALS/YR	Volatile Organic Compounds (VOC)		1.4	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C18 Pure Cut Tank (EQT 1194)	64.004		2	MM GALS/YR	Volatile Organic Compounds (VOC)		0.85	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C810 Alcohol Tank (EQT 1195)	64.004		21	MM GALS/YR	Volatile Organic Compounds (VOC)		3.9	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C1214 Alcohol Tank (EQT 1196)	64.004		13.2	MM GALS/YR	Volatile Organic Compounds (VOC)		2.51	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C1618 Alcohol Tank (EQT 1197)	64.004		6.4	MM GALS/YR	Volatile Organic Compounds (VOC)		2.84	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	C20+ Alcohol Tank (EQT 1198)	64.004		4.2	MM GALS/YR	Volatile Organic Compounds (VOC)		2.24	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol/Butanol Tank (EQT 158)	64.004		14.6	MM GALS/YR	Volatile Organic Compounds (VOC)		0.3	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tanks (EQTs 159 & 165)	64.004		7.22	MM GALS/YR	Volatile Organic Compounds (VOC)		0.69	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 171)	64.004		6.87	MM GALS/YR	Volatile Organic Compounds (VOC)		0.67	TPY

RBLC Search Results (VOC - Storage Tanks)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 174)	64.004		11.14	MM GALS/YR	Volatile Organic Compounds (VOC)		3.45	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 176)	64.004		4.56	MM GALS/YR	Volatile Organic Compounds (VOC)		1.58	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 182)	64.004		6.87	MM GALS/YR	Volatile Organic Compounds (VOC)		3.08	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Storage Tank (EQT 188)	64.004		22.08	MM GALS/YR	Volatile Organic Compounds (VOC)		2.64	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Storage Tank (EQT 189)	64.004		33.3	MM GALS/YR	Volatile Organic Compounds (VOC)		3.93	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alkoxide Tank Service (EQT 205)	64.004		3.67	MM GALS/YR	Volatile Organic Compounds (VOC)		1.76	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 210)	64.004		102.94	MM GALS/YR	Volatile Organic Compounds (VOC)		15.05	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Tank (EQT 213)	64.004		11.54	MM GALS/YR	Volatile Organic Compounds (VOC)		5.12	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Utility Tower Product Tank (EQT 192)	64.004		19.22	MM GALS/YR	Volatile Organic Compounds (VOC)		0.84	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Hotwash Solvent Tank (EQT 149)	64.004		5.96	MM GALS/YR	Volatile Organic Compounds (VOC)		8.58	TPY
LA-0303	LAKE CHARLES CHEMICAL COMPLEX ZIEGLER ALCOHOL UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-779	Alcohol Utility Tower Product Tank (EQT 193)	64.004		19.22	MM GALS/YR	Volatile Organic Compounds (VOC)		0.77	TPY
LA-0314	INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	PSD-LA-813	oil tank FA-712 - 012	64.004		66150	gal	Volatile Organic Compounds (VOC)	IFR with liquid mounted seal, double seal, or mechanical seal	0	
LA-0314	INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	PSD-LA-813	storm water surge tank TK-9 - 013	64.004		291410	gallons	Volatile Organic Compounds (VOC)	fixed roof	0	
LA-0314	INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	PSD-LA-813	process water storage tanks TK-301A/B - 017	64.004		350000	gallons	Volatile Organic Compounds (VOC)	EFR with primary and secondary seal, submerged fill pipe, and complying with 40 CFR 63 Subpart WW	0	
LA-0314	INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	PSD-LA-813	Methanol Tank TK-2	64.004		1469	gallons	Volatile Organic Compounds (VOC)	Submerged fill pipe and LAC 33:III.2103	0	
LA-0314	INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	PSD-LA-813	pyrolysis gasoline tank V-410	64.004		946996	gallons	Volatile Organic Compounds (VOC)	Closed vent system and routed to a flare, Complying with 40 CFR 60 Subpart Kb and LAC 33:III.2103	0	
*LA-0315	G2G PLANT	BIG LAKE FUELS LLC	PSD-LA-781	Crude Methanol Storage Tank	64.004		465.8	MM GALS/YR	Volatile Organic Compounds (VOC)	Fixed roof tank with water scrubber	0.53	LB/H
*LA-0315	G2G PLANT	BIG LAKE FUELS LLC	PSD-LA-781	Methanol Day Shift Tank 1	64.004		232.9	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal Floating Roof (IFR) Tank	0.17	LB/H
*LA-0315	G2G PLANT	BIG LAKE FUELS LLC	PSD-LA-781	Methanol Day Shift Tank 2	64.004		232.9	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal Floating Roof (IFR) Tank	0.17	LB/H
*LA-0315	G2G PLANT	BIG LAKE FUELS LLC	PSD-LA-781	Product Methanol Tank	64.004		465.8	MM GALS/YR	Volatile Organic Compounds (VOC)	Internal Floating Roof (IFR) Tank	0.27	LB/H
LA-0319	LAKE CHARLES CHEMICAL COMPLEX - COMONOMER-1 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-814	Storage tanks (7 tanks)	64.004		0		Volatile Organic Compounds (VOC)	Equipped with internal floating roofs (IFR)	0	
LA-0319	LAKE CHARLES CHEMICAL COMPLEX - COMONOMER-1 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-814	storage tank t12-917	64.004		88128	gal	Volatile Organic Compounds (VOC)	Submerged fill pipe	0	
LA-0320	ST. CHARLES REFINERY	VALERO REFINING COMPANY - NEW ORLEANS LLC	PSD-LA-619(M11)	BTX Unit Tanks	64.004		0		Volatile Organic Compounds (VOC)	Comply with 40 CFR 63 Subpart G (HON)	0	
*TN-0163	HOLSTON ARMY AMMUNITION PLANT	BAE SYSTEMS ORDNANCE SYSTEMS INC.	974192	Process Tanks	64.004		0		Volatile Organic Compounds (VOC)		0.19	TONS/12 MONTHS
TX-0774	BISHOP FACILITY	TICONA POLYMERS, INC.	123216, PSDTX1438 AND GHGPSDTX	Storage Tanks	64.004		6	MMgal/yr	Volatile Organic Compounds (VOC)	Submerged fill, white tanks with internal floating roofs.	6.86	TPY

RBLC Search Results (VOC - Storage Tanks)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
TX-0804	ADN UNIT	INVISTA S.A R.L.	7186, PSDTX1079M1, GHGPSDTX145	Storage Tanks 10TFX022 and 10TFX057	64.004		0		Volatile Organic Compounds (VOC)	60.18 Flare	3.4	T/YR
TX-0811	LINEAR ALPHA OLEFINS PLANT	INEOS OLIGOMERS USA LLC	136130 AND N250	SOCMI Floating Roof Storage Tanks	64.004		0		Volatile Organic Compounds (VOC)	A vapor recovery system captures all vapor under tank shell and routes them to a thermal oxidizer. For alpha olefins, product quality considerations dictate the use of a nitrogen blanketing system	0.01	T/YR
TX-0811	LINEAR ALPHA OLEFINS PLANT	INEOS OLIGOMERS USA LLC	136130 AND N250	SOCMI Fixed Roof Storage Tanks	64.004		0		Volatile Organic Compounds (VOC)	Fixed roof tanks: no add-on controls. Volatility of stock limited to 0.10 psia by permit condition. For alpha olefins, product quality considerations dictate the use of a nitrogen blanketing system.	0.17	T/YR
TX-0815	PORT ARTHUR ETHANE SIDE CRACKER	TOTAL PETROCHEMICALS & REFINING USA, INC.	122353, PSDTX1426, GHGPSDTX114	STORAGE TANKS	64.004		0		Volatile Organic Compounds (VOC)	THERMAL OXIDIZER	0	
TX-0823	LYONDELL CHEMICAL BAYPORT CHOATE PLANT	LYONDELL CHEMICAL COMPANY	137789 AND N244	STORAGE TANKS	64.004		0		Volatile Organic Compounds (VOC)	vessels will be equipped with suspended IFR for materials of vapor pressures greater than 0.5 psia and less than 11.0 psia.	4.72	T/YR
TX-0823	LYONDELL CHEMICAL BAYPORT CHOATE PLANT	LYONDELL CHEMICAL COMPANY	137789 AND N244	STORAGE TANKS	64.004		0		Volatile Organic Compounds (VOC)	storage of a by-product stream mixture of light liquids will be constructed of stainless steel to minimize corrosive effects from water in the stored materials; these vessels are equipped with fixed roofs, coated with black epoxy to minimize external corrosion and their emissions will be flared.	0	
TX-0843	VICTORIA PLANT	INVISTA S.A.R.L.	PSDTX1079M2, GHGPSDTX145 M1	PROCESS VESSELS AND TANKS	64.004		0		Volatile Organic Compounds (VOC)	Minimum Control for Vertical Fixed Roof (VFR) Tanks a) All surfaces exposed to the sun are painted white b) Submerged fill c) True Vapor Pressure (TVP) of contents less than 11 psia For VFR tank contents TVP greater than 0.5 psia and tank capacity capacity greater than or equal to 25,000 gallons vent to flare with minimum DRE of 98%.	41	T/YR
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Fixed Roof Tanks	64.004		0		Volatile Organic Compounds (VOC)	painted white and employ bottom or submerged fill. Storage tanks with capacities less than 25,000 gallons which store stocks with a VOC vapor pressure of less than 0.50 psia are exempt	0	
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Floating Roof Tanks	64.004		0		Volatile Organic Compounds (VOC)	internal floating roof with a welded deck. Floating roof tanks must be designed with a sump whose drain pipe discharges to no more than one diameter above the bottom of the sump, and must be designed with a connection to a control device for use during floating roof landings	0	

RBLC Search Results (VOC - Floating Roof)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
CA-1180	CHEVRON PRODUCTS CO	CHEVRON PRODUCTS CO	22722	Recovered oil storage tank, external floating roof with dome	42.006		0		Volatile Organic Compounds (VOC)	Requires domes on external floating roof tanks.	0	
CA-1230	SFPP,LP		APCD2009-APP-988083	internal floating roof-denatured etahnol cargo tank unloading station	42.002	DENATURED ETHANOL	325	gallons	Volatile Organic Compounds (VOC)	DIRECT PUMP TO IFR TANK-INTERGRAL VALVES FOR DRY DISCONNECT	13.39	LB/D
CA-1236	SFPP,LP		APCD2014-APP-003322	Internal floating roof storage tank	42.006	GASOLINE	0		Volatile Organic Compounds (VOC)	Dual rim seals	1763.25	LB
NJ-0083	COLONIAL PIPELINE CO LINDEN JCT TANK FARM	COLONIAL PIPELINE	18046 / BOP130002	26 Internal floating roof storage tanks for materials with RVP <= 15	42.006	Material with RVP <= 15	2072718	MGAL/YR	Volatile Organic Compounds (VOC)	Vapor combustion unit for cleaning & roof landings	0	
OK-0139	CUSHING TERMINAL CRUDE OIL STORAGE FACILITY	PLAINS MARKETING LP	2003-104-C(M-4)PSD	Crude Oil Storage in External Floating Roof Tanks	42.006	NA	570000	Barrels	Volatile Organic Compounds (VOC)	No controls feasible ; external floating roof tanks.	437.35	TONS
*TX-0653	TEXAS DOCK AND RAIL	TRAFIGURA TERMINALS LLC	106594/PSD TX1324	Petroleum Liquid Marketing; Petroleum Liquid Storage in Floating Roof Tanks	42.006	natural gas as pilot fuel for VCU	250	Mbbl	Volatile Organic Compounds (VOC)	For storage of VOC in floating roof tanks, the tanks will have welded decks, mechanical shoe primary and rim-mounted secondary seal for VOC with a vapor pressure >0.5 psia. Floating roof tank landings are limited in frequency and duration.	11.23	TPY
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	MAGELLAN PROCESSING LP	118270 AND PSDTX1398	Petroleum Liquids Storage in Fixed Roof Tanks	42.005		3.4	MMBbl/yr/tank	Volatile Organic Compounds (VOC)	Temperature reduced to maintain volatile organic compound (VOC) vapor pressure < 0.5 pounds per square inch actual (psia) at all times.	15.78	TONS/YR/TANK
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	MAGELLAN PROCESSING LP	118270 AND PSDTX1398	Petroleum Liquids Storage in Floating Roof Tanks	42.006		8	MMBbl/yr/tank	Volatile Organic Compounds (VOC)	Required floating roof with welded deck seams if the tank will store products with VOC vapor pressure of 0.5 psia or greater. Proper fitting and seal integrity for the floating roof is ensured through visual inspections and any seal gap measurements specified in 40 CFR Â§ 60.113b. The vapor space under the floating roof must be routed to a control device during standing idle periods until the vapor space VOC concentration is 10,000 ppmv or less. The tank roof must be landed on its lowest legs unless tank entry is planned. Refilling must also be controlled if the product stored has a VOC vapor pressure of 0.5 psia or greater.	5.09	TONS/YR/TANK
TX-0745	TEXAS DOCK & RAIL	BUCKEYE TEXAS HUB LLC	106594 AND PSDTX1324 M1	Petroleum Liquids Storage in Floating Roof Tanks - 45 MMbbl	42.006		48	turnovers/yr/tank	Volatile Organic Compounds (VOC)	Required floating roof with welded deck seams if the tank will store products with VOC vapor pressure of 0.5 psia or greater. Proper fitting and seal integrity for the floating roof is ensured through visual inspections and any seal gap measurements specified in 40 CFR Â§ 60.113b. The vapor space under the floating roof must be routed to a control device during standing idle periods until the vapor space VOC concentration is 10,000 ppmv or less. The tank roof must be landed on its lowest legs unless tank entry is planned. Refilling must also be controlled if the product stored has a VOC vapor pressure of 0.5 psia or greater.	2.06	TONS/YR/TANK

TX-0745	TEXAS DOCK & RAIL	BUCKEYE TEXAS HUB LLC	106594 AND PSDTX1324 M1	Petroleum Liquids Storage in Floating Roof Tanks - 50 MMBbl	42.006		60	turnovers/yr/tank	Volatile Organic Compounds (VOC)	Required floating roof with welded deck seams if the tank will store products with VOC vapor pressure of 0.5 psia or greater. Proper fitting and seal integrity for the floating roof is ensured through visual inspections and any seal gap measurements specified in 40 CFR Â§ 60.113b. The vapor space under the floating roof must be routed to a control device during standing idle periods until the vapor space VOC concentration is 10,000 ppmv or less. The tank roof must be landed on its lowest legs unless tank entry is planned. Refilling must also be controlled if the product stored has a VOC vapor pressure of 0.5 psia or greater.	4.18	TONS/YR/TANK
TX-0745	TEXAS DOCK & RAIL	BUCKEYE TEXAS HUB LLC	106594 AND PSDTX1324 M1	Petroleum Liquids Storage in Floating Roof Tanks -115 MMBbl	42.006		60	turnovers/yr/tank	Volatile Organic Compounds (VOC)	Required floating roof with welded deck seams if the tank will store products with VOC vapor pressure of 0.5 psia or greater. Proper fitting and seal integrity for the floating roof is ensured through visual inspections and any seal gap measurements specified in 40 CFR Â§ 60.113b. The vapor space under the floating roof must be routed to a control device during standing idle periods until the vapor space VOC concentration is 10,000 ppmv or less. The tank roof must be landed on its lowest legs unless tank entry is planned. Refilling must also be controlled if the product stored has a VOC vapor pressure of 0.5 psia or greater.	3.71	TONS/YR/TANK
TX-0745	TEXAS DOCK & RAIL	BUCKEYE TEXAS HUB LLC	106594 AND PSDTX1324 M1	Petroleum Liquids Storage in Floating Roof Tanks - 285 MMBbl	42.006		36	turnovers/yr/tank	Volatile Organic Compounds (VOC)	Required floating roof with welded deck seams if the tank will store products with VOC vapor pressure of 0.5 psia or greater. Proper fitting and seal integrity for the floating roof is ensured through visual inspections and any seal gap measurements specified in 40 CFR Â§ 60.113b. The vapor space under the floating roof must be routed to a control device during standing idle periods until the vapor space VOC concentration is 10,000 ppmv or less. The tank roof must be landed on its lowest legs unless tank entry is planned. Refilling must also be controlled if the product stored has a VOC vapor pressure of 0.5 psia or greater.	7.32	TONS/YR/TANK
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks, TK-101, TK-102, TK-103, TK-104	42.006		383000000	gal/yr/tank	Volatile Organic Compounds (VOC)	Internal floating roof with mechanical shoe primary seal and a rim mounted secondary seal. Deck is welded with gaskets on all deck appurtenances. The tank bottoms shall be drain dry design â€“ any remaining heel will drain to a sump, which in turn can be emptied. The floating roof shall be equipped with a connection to a vapor recovery system such that vapors from under a landed roof may be directed to a control device.	6.44	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks, TK-105, TK-106	42.006		300000000	gal/yr/tank	Volatile Organic Compounds (VOC)	Internal floating roof with mechanical shoe primary seal and a rim mounted secondary seal. Deck is welded with gaskets on all deck appurtenances. The tank bottoms shall be drain dry design â€“ any remaining heel will drain to a sump, which in turn can be emptied. The floating roof shall be equipped with a connection to a vapor recovery system such that vapors from under a landed roof may be directed to a control device.	2.35	LB/R
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks 116, TK-117, TK-118, and TK-119	42.006		744282000	gal/yr/tank	Volatile Organic Compounds (VOC)	Internal floating roof with mechanical shoe primary seal and a rim mounted secondary seal. Deck is welded with gaskets on all deck appurtenances. The tank bottoms shall be drain dry design â€“ any remaining heel will drain to a sump, which in turn can be emptied. The floating roof shall be equipped with a connection to a vapor recovery system such that vapors from under a landed roof may be directed to a control device.	6.38	LB/HR

TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks, TK-107, TK-108, TK-109, 42.005	42.006		60300	gal/hr	Volatile Organic Compounds (VOC)	Material w/vapor press < 0.5 psia. Tanks are required to be painted white and be equipped with submerged fill pipes	4.2	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks, TK-110, TK-111, TK-112	42.005		57960	gal/hr	Volatile Organic Compounds (VOC)	Tanks are required to be painted white and be equipped with submerged fill pipes	3.07	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks, TK-113, TK-114, and TK-115	42.005		47000000	gal/yr/tank	Volatile Organic Compounds (VOC)	Tanks are required to be painted white and be equipped with submerged fill pipes	0.85	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Wastewater Tank, TK-3	64.006		8000000	gallons/yr	Volatile Organic Compounds (VOC)	Tank is required to be painted white and be equipped with submerged fill pipes	0.01	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Spent Caustic Tank, TK-4	50.009		35000	gallons/yr	Volatile Organic Compounds (VOC)	Tank is required to be painted white and be equipped with submerged fill pipes	0.01	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Storage Tanks, TK-120 and TK-121	42.006		1437817500	gal/yr/tank	Volatile Organic Compounds (VOC)	External floating roof with mechanical shoe primary seal and a rim mounted secondary seal. Deck is welded with gaskets on all deck appurtenances. The tank bottoms shall be drain dry design â€“ any remaining heel will drain to a sump, which in turn can be emptied. The floating roof shall be equipped with a connection to a vapor recovery system such that vapors from under a landed roof may be directed to a control device.	5.43	LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Floating Roof Storage Tanks - Controlled Maintenance, Startup and Shutdown (MSS)	42.006		5000	scf/hr	Volatile Organic Compounds (VOC)	Vapor space under the landed floating roof is degassed to a flare meeting the requirements 40CFR60.18 until VOC concentration is 10,000 ppmv or less.	10000	PPMV
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	JEFFERSON RAILPORT TERMINAL I TEXAS LLC	118901, GHGPSDTX108 AND PSDTX1	Petroleum Liquids Storage in Floating Roof Tanks	42.006		276565714	BBL/YR	Volatile Organic Compounds (VOC)	Floating roof with mechanical shoe primary seals and secondary seals if the tank will store products with VOC vapor pressure of 0.5 psia or greater. Proper fitting and seal integrity for the floating roof is ensured through visual inspections and any seal gap measurements specified in 40 CFR Â§ 60.113b. If the product stored has a VOC vapor pressure of 0.5 psia or greater, standing idle, degassing, and refilling emissions during tank landings are routed to temporary control units for control with a minimum control efficiency of 98%.	289.13	T/YR
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	JEFFERSON RAILPORT TERMINAL I TEXAS LLC	118901, GHGPSDTX108 AND PSDTX1	Petroleum Liquids Storage in Fixed Roof Tanks	42.005		47.62	BBL/YR	Volatile Organic Compounds (VOC)	Tank uses submerged fill and is aluminum in color.	0.01	T/YR
TX-0797	CORPUS CHRISTI TERMINAL	NUSTAR LOGISTICS LP	32769/ PSDTX1258 M2/ O-1238	Petroleum Liquid Storage in Floating Roof Tanks	42.006		146	MM BBL / YR	Volatile Organic Compounds (VOC)	Petroleum products are stored in floating roof tanks.	24.37	T/YR

TX-0799	BEAUMONT TERMINAL	PHILLIPS 66 PIPELINE LLC	18295, PSDTX1466, GHGPSDTX139	Storage Tanks -IFR	42.006		0		Volatile Organic Compounds (VOC)	IFR tanks (EPNs 169, 216, 218, 221, 230, 233, 234, 236, and 255) have a liquid-mounted primary seal. IFR tanks (EPNs 396 and 397) have a vapor-mounted primary seal and rim-mounted secondary seal. Methanol tanks (EPNs 300, 301, 302) have a mechanical shoe primary seal and rim-mounted secondary seal. All of these tanks are greater than 25 Mgal and store liquids with a TVP less than 11.0 psia, are painted white, and use submerged fill.	109.17	T/YR
TX-0799	BEAUMONT TERMINAL	PHILLIPS 66 PIPELINE LLC	18295, PSDTX1466, GHGPSDTX139	Storage Tanks - EFR	42.006		0		Volatile Organic Compounds (VOC)	All 68 EFR tanks are greater than 25 Mgal and store liquids with a TVP less than 11.0 psia. They have a mechanical shoe primary seal, rim-mounted secondary seal, and slotted guide poles with gasketed sliding covers pole sleeves, and pole wipers. All EFR tanks are painted white, with the exception of Tank 167, which is currently out of service. Tank 167 will be painted white before it is returned to service. The 37 new tanks have drain dry design.	384.37	T/YR
TX-0799	BEAUMONT TERMINAL	PHILLIPS 66 PIPELINE LLC	18295, PSDTX1466, GHGPSDTX139	Storage Tanks - fixed roof	42.005		0		Volatile Organic Compounds (VOC)	Fixed-roof tanks (EPNs 168, 222, 225, 227,229, 254, 256, 257, 258, 259, 475, and 476) will use submerged fill and have white exterior surfaces. Fuel tanks (EPN DTK01 and GTK01) are horizontal fixed-roof design and will use submerged fill and have white or aluminum exterior surfaces.	72.5	T/YR
TX-0799	BEAUMONT TERMINAL	PHILLIPS 66 PIPELINE LLC	18295, PSDTX1466, GHGPSDTX139	Storage Tanks Floating Roof MSS	42.006		0		Volatile Organic Compounds (VOC)	Landing, degassing, and refilling events will be controlled by a portable VCU or thermal oxidizer meeting TCEQ BACT. Degassing will begin within 24 hours of roof landing. All new tanks have drain dry design.	28.83	T/YR
TX-0800	CORPUS CRUDE OIL TERMINAL	MARTIN OPERATING PARTNERSHIP L.P.	103976, PSDTX1406	Storage Tanks	42.006		3655000	BBL/YR	Volatile Organic Compounds (VOC)	Crude/Condensate storage tanks will have capacities greater than 25,000 gallons. Crude/condensate has a vapor pressure greater than 0.5 psia at 95Â°F. The storage tanks will be white internal floating roof tanks with mechanical shoe seals. New tanks will be of drain-dry design.	57.42	T/YR
TX-0800	CORPUS CRUDE OIL TERMINAL	MARTIN OPERATING PARTNERSHIP L.P.	103976, PSDTX1406	Floating Roof Storage Tanks - Controlled Maintenance, Startup and Shutdown (MSS)	42.006		0		Volatile Organic Compounds (VOC)	Landing, degassing, and refilling events will be controlled by a VCU or carbon adsorption unit. Degassing will begin within 24 hours of roof landing. All new tanks will be of drain-dry design.	0.8	T/YR
TX-0811	LINEAR ALPHA OLEFINS PLANT	INEOS OLIGOMERS USA LLC	136130 AND N250	SOCMI Floating Roof Storage Tanks	64.004		0		Volatile Organic Compounds (VOC)	A vapor recovery system captures all vapor under tank shell and routes them to a thermal oxidizer. For alpha olefins, product quality considerations dictate the use of a nitrogen blanketing system	0.01	T/YR
TX-0811	LINEAR ALPHA OLEFINS PLANT	INEOS OLIGOMERS USA LLC	136130 AND N250	SOCMI Fixed Roof Storage Tanks	64.004		0		Volatile Organic Compounds (VOC)	Fixed roof tanks: no add-on controls. Volatility of stock limited to 0.10 psia by permit condition. For alpha olefins, product quality considerations dictate the use of a nitrogen blanketing system.	0.17	T/YR
TX-0812	CRUDE OIL PROCESSING FACILITY	GRAVITY MIDSTREAM CORPUS CHRISTI LLC	9342A, 9343A, PSDTX963M1, GHGP	Petroleum Liquid Storage in Floating Roof tanks	42.006		0		Volatile Organic Compounds (VOC)	Internal floating roof. Integrity of the floating roof seal must be verified through periodic visual inspections and seal gap measurements. The tank must be constructed with a drain dry sump, and an available connection to a control device.	3.04	T/YR
TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Internal floating roof storage tanks	49.006		0		Volatile Organic Compounds (VOC)	IFR equipped with a primary and secondary seal, painted white, and has drain dry floor design.	165	T/YR
TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Internal floating roof storage tanks maintenance, startup, and shutdown	42.006		0		Volatile Organic Compounds (VOC)	Roof landings will be routed to control device for a 99.8% destruction efficiency and refilling losses will be controlled by a portable vapor combustor unit with a 99.5% collection efficiency.	26.28	T/YR
TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Horizontal fixed roof storage tanks	42.005		0		Volatile Organic Compounds (VOC)	painted white, has submerged fill	0.37	T/YR

TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Horizontal fixed roof storage tanks maintenance, start up, and shutdown	42.005		0		Volatile Organic Compounds (VOC)	Degassing and refilling losses will be controlled by vapor combustor with a 99.5% destruction efficiency.	26.28	T/YR
TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Tank Truck Loading	42.01		120000	GAL/HR	Volatile Organic Compounds (VOC)	All loading will be submerged fill and vented to a vapor recovery unit. Vapor collection system will operate with 100% capture efficiency and routed to vapor recovery unit	1	MG/LTR
TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Tank Truck Loading	42.01		120000	GAL/HR	Volatile Organic Compounds (VOC)	All loading will be submerged fill and vented to a vapor recovery unit. Air eliminator venting will result in emissions to the atmosphere at less than 3 lb/hr for air purging in truck tanks.	4.48	T/YR
TX-0825	PASADENA TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.	142261 AND N254	Tank Truck Unloading	42.01		0		Volatile Organic Compounds (VOC)	Specialized connection system of transfer valves that minimize the volume of piping containing residual butane after unloading	33	T/YR
TX-0847	VALERO PORT ARTHUR REFINERY	PREMCOR REFINING GROUP	6825A, N65, PSDTX49M1, GHGPSDT	External Floating roof storage tanks	42.006		45000	BBL/HR	Volatile Organic Compounds (VOC)	Tanks will be equipped with Mechanical shoe seal with a secondary rim mounted seal. Tanks equipped with slotted guidepoles with gasketed sliding covers, either pole sleeves or floats, and wipers. Tanks will also be constructed with drain dry design. These tanks will be equipped with welded deck seams since the tank will store products with VOC vapor pressure of 0.5 psia or greater.	0	
TX-0847	VALERO PORT ARTHUR REFINERY	PREMCOR REFINING GROUP	6825A, N65, PSDTX49M1, GHGPSDT	Coker sludge feed tanks	42.005		12000	GAL/HR	Volatile Organic Compounds (VOC)	NON REGENERATIVE CARBON ADSORBER	100	PPM
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Fixed Roof Tanks	64.004		0		Volatile Organic Compounds (VOC)	painted white and employ bottom or submerged fill. Storage tanks with capacities less than 25,000 gallons which store stocks with a VOC vapor pressure of less than 0.50 psia are exempt	0	
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Floating Roof Tanks	64.004		0		Volatile Organic Compounds (VOC)	internal floating roof with a welded deck. Floating roof tanks must be designed with a sump whose drain pipe discharges to no more than one diameter above the bottom of the sump, and must be designed with a connection to a control device for use during floating roof landings	0	
VA-0313	TRANSMONTAIGNE NORFOLK TERMINAL	TRANSMONTAIGNE OPERATING COMPANY LP	60242	Storage Tank Breathing, Working, and Floating Roof Landing Losses (including emergency roof landings)	42.006		0		Volatile Organic Compounds (VOC)	Floating Roof and Seal Systems meeting NSPS Kb, MACT BBBBBB requirements for Tanks in Gasoline Service	114.1	T/YR

RBLC Search Results (VOC - Cooling Towers)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
FL-0318	HIGHLANDS ETHANOL FACILITY	VERENIUM	PSD-FL- 406 (0550061-001-AC)	Cooling Tower	99.009		22500	GAL/MIN	Volatile Organic Compounds (VOC)	The cooling tower shall be constructed to achieve the specified drift rate of no more than 0.0005 percent of the circulating water flow rate.	4.1	T/YR
FL-0332	HIGHLANDS BIOREFINERY AND COGENERATION PLANT	HIGHLANDS ENVIROFUELS (HEF), LLC	PSD-FL-416, 0550063-001-AC	Cooling Towers (miscellaneous machinery)	12.12		0		Volatile Organic Compounds (VOC)	The permittee shall control VOC emissions by promptly repairing any leaking components in accordance with the approved LDAR plan. The permittee shall collect a sample of cooling water on a weekly basis from miscellaneous machinery and process equipment cooling towers and analyze it for VOCs to enable the early detection of leaking heat exchangers and thereby minimizing VOC emissions from the cooling towers.	0.001	% WATER FLOW RATE
IA-0102	DAVENPORT WORKS	ALCOA, INC.	11-322	Cooling Towers	99.999		3000	GAL/MIN	Volatile Organic Compounds (VOC)	Facility is required to limit the amount of VOC in water treatment chemicals and the use of those chemicals. In addition the cooling towers have drift eliminators as control.	0	
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPLEX	CF INDUSTRIES NITROGEN, LLC	PN 13-037	Cooling Towers	99.009		0		Volatile Organic Compounds (VOC)	limit the amount of VOC in treatment chemicals and a drift eliminator	0	
IN-0202	IPL EAGLE VALLEY GENERATING STATION	IPL EAGLE VALLEY GENERATING STATION	109-32471-00004	COOLING TOWER EU-7	99.999	WATER	192000	GPM	Volatile Organic Compounds (VOC)		4.8	G/BHP-H
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M5)	COOLING TOWERS (13-81, 2004-6, 2005-42, 2005-43, 2008-35)	99.009				Volatile Organic Compounds (VOC)	MONITORING PROCESS SIDE OF THE HEAT EXCHANGERS FOR LEAKS 2008-35: VOC MONITORING PROGRAM MEETS 40 CFR 63 SUBPART F	0	
LA-0246	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M6)	EQT0010 - Cooling Tower 403	50.999		61250	GAL/MIN	Volatile Organic Compounds (VOC)	Monitoring VOC concentration in cooling water	76	LB/H
LA-0246	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M6)	EQT0035 - Cooling Tower CT-600	50.999		45000	GAL/MIN	Volatile Organic Compounds (VOC)	Monitoring VOC concentration in cooling water	55.84	LB/H
LA-0246	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M6)	EQT0243 - HCU Cooling Tower	50.999		50000	GAL/MIN	Volatile Organic Compounds (VOC)	Monitoring VOC concentration in cooling water	62.04	LB/H
LA-0246	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	PSD-LA-619(M6)	EQT0244 - New West Cooling Tower	50.999		40000	GAL/MIN	Volatile Organic Compounds (VOC)	Monitoring VOC concentration in cooling water	49.63	LB/H
LA-0277	COMONIMER-1 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-814	Cooling Tower Y12-800	64.999		15200	gpm	Volatile Organic Compounds (VOC)	Comply with requirements of 40 CFR 63.104	0	
LA-0295	WESTLAKE FACILITY	EQUISTAR CHEMICALS, LP	PSD-LA-806	CGP Unit Cooling Tower (3-03, EQT 15)	99.009		3000	GPM	Volatile Organic Compounds (VOC)	Monthly hydrocarbon monitoring; maintain equipment to minimize fugitive emissions; repair faulty equipment at the earliest opportunity, but no later than the next scheduled unit shutdown	0.13	LB/H
LA-0314	INDORAMA LAKE CHARLES FACILITY	INDORAMA VENTURES OLEFINS, LLC	PSD-LA-813	cooling towers - 007	99.009		86500	gpm	Volatile Organic Compounds (VOC)	monitored as required by 40 CFR 63 subpart XX	0	
*LA-0315	G2G PLANT	BIG LAKE FUELS LLC	PSD-LA-781	Cooling Tower	99.009		6472902	GPM	Volatile Organic Compounds (VOC)	Monthly VOC monitoring	4.53	LB/H
LA-0319	LAKE CHARLES CHEMICAL COMPLEX - COMONOMER-1 UNIT	SASOL CHEMICALS (USA) LLC	PSD-LA-814	cooling tower y12-800	99.009		0		Volatile Organic Compounds (VOC)	Complying with 40 CFR 63.104	0	
*LA-0334	ST. CHARLES REFINERY	VALERO REFINING COMPANY - NEW ORLEANS LLC	PSD-LA-826	EQT0244 Alky Cooling Tower (2005-43)	50.999		40	GAL/MIN	Volatile Organic Compounds (VOC)	COMPLY WITH 40 CFR 63 SUBPART F	0	

RBLC Search Results (VOC - Cooling Towers)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
MS-0092	EMBERCLEAR GTL MS	EMBERCLEAR GTL MS LLC	0040-00055	Cooling tower, Induced draft	99.009		1420	GAL/MIN	Volatile Organic Compounds (VOC)	Monthly strippable VOC monitoring (modified El Paso Method)	0.7	LB VOC/MMGAL WATER
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	PTTGCA PETROCHEMICAL COMPLEX	P0124972	Cooling Tower (P011)	99.009		13.88	MMGAL/H	Volatile Organic Compounds (VOC)	(a) VOC content in cooling water shall not exceed a concentration of 0.7 lb/MMgal; (b) Compliance with heat exchange leak monitoring and repair requirements for affected ethylene manufacturing process units contained in 40 CFR Part 63 Subpart XX	42.55	T/YR
PA-0312	MONROE ENERGY LLC/TRAINER	MONROE ENERGY, LLC	23-0003Z	Cooling Tower 1	50.999		12050	gal/min	Volatile Organic Compounds (VOC)	Annual average VOC concentration in the recirculating cooling water shall not exceed 31 ppmw calculated monthly and averaged on a 12 month rolling basis	31	PPMW
PA-0312	MONROE ENERGY LLC/TRAINER	MONROE ENERGY, LLC	23-0003Z	FCC Cooling Tower	50.999		28500	gal/min	Volatile Organic Compounds (VOC)	Annual average VOC concentration in the recirculating cooling water shall not exceed 31 ppmw calculated monthly and averaged on a 12 month rolling basis	31	PPMW
PA-0312	MONROE ENERGY LLC/TRAINER	MONROE ENERGY, LLC	23-0003Z	Crude Cooling Tower	50.999		36850	gal/min	Volatile Organic Compounds (VOC)	Annual average VOC concentration in the recirculating cooling water shall not exceed 31 ppmw calculated monthly and averaged on a 12 month rolling basis	31	PPMW
SC-0182	FIBER INDUSTRIES LLC	FIBER INDUSTRIES LLC	0820-0079.CA.R2	Cooling Towers	63.028		0		Volatile Organic Compounds (VOC)	Non-Contact System Design	0	
SC-0183	NUCOR STEEL - BERKELEY	NUCOR STEEL	0420-0060-DX	Cooling Towers	81.29		0		Volatile Organic Compounds (VOC)	Proper Operation and Maintenance	0.23	TPY
SC-0183	NUCOR STEEL - BERKELEY	NUCOR STEEL	0420-0060-DX	Cooling Towers (contact cooling tower)	81.29		0		Volatile Organic Compounds (VOC)	Proper Operation and Maintenance	0.044	TPY
TX-0575	SABINA PETROCHEMICALS LLC	SABINA PETROCHEMICALS LLC	41945, N018M1	COOLING TOWER	50.007	N/A	73000	GAL/MIN	Volatile Organic Compounds (VOC)	THE COOLING TOWER, EPN CT, HAS A NON-CONTACT DESIGN, UTILIZES MONTHLY MONITORING OF VOC IN WATER PER APPENDIX P OR APPROVED EQUIVALENT AND IDENTIFIED LEAKS ARE REPAIRED AS SOON AS POSSIBLE, BUT BEFORE NEXT SCHEDULED SHUTDOWN.	13.43	T/YR
TX-0656	GAS TO GASOLINE PLANT	NATGASOLINE	PSDTX1340 AND 107764	Cooling Tower	50.002		99000	MM GAL/YR	Volatile Organic Compounds (VOC)	DRIFT ELIMINATORS, MONITOR TDS OR CONDUCTIVITY	0.08	PPM
*TX-0657	BEAUMONT GAS TO GASOLINE PLANT	NATGASOLINE LLC	PSDTX1340 AND 107764	cooling tower	50.002		99000000	gallons/yr	Volatile Organic Compounds (VOC)	Monthly monitoring of VOC not to exceed 0.08 ppmw	0.08	PPMW
TX-0711	CELANESE CLEAR LAKE PLANT	CELANESE LTD	103626, N164, PSDTX1296	Cooling Tower	99.999		0		Volatile Organic Compounds (VOC)		0	
TX-0754	PROPANE DEHYDROGENATION UNIT	THE DOW CHEMICAL COMPANY	100787 AND PSDTX1314M1	Cooling Tower	99.009		75000	gallons per minute	Volatile Organic Compounds (VOC)	Non-contact design, drift eliminators with drift of 0.0005%	0.05	PPM
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	CASTLETON COMMODITIES INTERNATIONAL (CCI) CORPUS C	116072 AND PSDTX1388	Cooling Tower	99.009		900000	gal/hr	Volatile Organic Compounds (VOC)	no contact. low drift	0.6	LB/HR

RBLC Search Results (VOC - Cooling Towers)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
TX-0774	BISHOP FACILITY	TICONA POLYMERS, INC.	123216, PSDTX1438 AND GHGPSDTX	Cooling Tower	99.009		10400		Volatile Organic Compounds (VOC)	Minimize VOC leaks into cooling water	3.64	TPY
TX-0815	PORT ARTHUR ETHANE SIDE CRACKER	TOTAL PETROCHEMICALS & REFINING USA, INC.	122353, PSDTX1426, GHGPSDTX114	Cooling Tower	99.009		0		Volatile Organic Compounds (VOC)	cooling water VOC concentration NON CONTACT	27.95	T/YR
TX-0823	LYONDELL CHEMICAL BAYPORT CHOATE PLANT	LYONDELL CHEMICAL COMPANY	137789 AND N244	COOLING TOWERS	64.999		0		Volatile Organic Compounds (VOC)	VOC leak detection system to identify leaks into the cooling water.	4.05	T/YR
TX-0847	VALERO PORT ARTHUR REFINERY	PREMCOR REFINING GROUP	6825A, N65, PSDTX49M1, GHGPSDT	Cooling Towers/Heat Exchange System	50.002		0		Volatile Organic Compounds (VOC)	NONCONTACT	0.08	PPMW
*TX-0858	GULF COAST GROWTH VENTURES PROJECT	GCGV ASSET HOLDING LLC	146425, PSDTX1518, GHGPSDTX170	Cooling Tower	64.003		0		Volatile Organic Compounds (VOC)	Weekly sampling of cooling water for strippable VOC. Corrective action must be taken if total strippable hydrocarbon content of the cooling water exceeds 0.08 ppmw equivalent, and delay of repair procedures cannot be used if the strippable hydrocarbon content exceeds 0.8 ppmw. Additionally, the permit specifies that a cooling water concentration qualifying as a leak under MACT XX is also a leak for purposes of permit compliance	0.4	PPMW
*TX-0861	BUCKEYE TEXAS PROCESSING CORPUS CHRISTI FACILITY	BUCKEYE TEXAS PROCESSING, LLC	109923, PSDTX1502, AND GHGPSDT	Cooling Tower	99.009		3000	GPM	Volatile Organic Compounds (VOC)	no contact design	0.08	PPMW
*TX-0863	POLYETHYLENE 7 FACILITY	THE DOW CHEMICAL COMPANY	153106 AND N268	COOLING TOWER	99.009		0		Volatile Organic Compounds (VOC)	Monthly monitoring cooling water for VOC content	0	
*TX-0864	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N266, PSDTX1542, GHGPSDTX183	Cooling Tower	99.009		0		Volatile Organic Compounds (VOC)	nondirect	0	
*TX-0865	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	N264, PSDTX1540, GHGPSDTX182	COOLING TOWER	99.009		0		Volatile Organic Compounds (VOC)	INDIRECT DESIGN	42	PPBW
*WI-0286	SIO INTERNATIONAL WISCONSIN, INC. - ENERGY PLANT	SIO INTERNATIONAL	18-JJW-022	P41 â€“ Cooling Tower	90.009		0		Volatile Organic Compounds (VOC)	The available options described for controlling visible emissions are generally the controls for controlling particulate matter emissions.	10	% OPACITY

RBLC Search Results (PM - Cooling Tower)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
AK-0083	KENAI NITROGEN OPERATIONS	AGRIUM U.S. INC.	AQ0083CPT 06	2 Cell Cross-Flow Cooling Tower	99.11		15000	gallons per minute	Particulate matter, fugitive	High Efficiency Drift Eliminators	0.002	% DRIFT
*FL-0368	NUCOR STEEL FLORIDA FACILITY	NUCOR STEEL FLORIDA, INC.	1050472-001-AC	Two Cooling Towers	99.009		19650	gal/min	Particulate matter, total (TPM)	Drift eliminators	0.001	% DRIFT RATE
GA-0141	WARREN COUNTY BIOMASS ENERGY FACILITY	OGETHORPE POWER CORPERATION	4911-301-0016-P-01-0	Cooling Tower	99.009		0		Particulate matter, filterable (FPM)	Drift Eliminators	0.0005	% EFFECTIVENESS
IA-0105	IOWA FERTILIZER COMPANY	IOWA FERTILIZER COMPANY	12-219	Cooling Tower	61.999		0		Particulate matter, total (TPM)	drift eliminator	0.0005	%
IA-0106	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN COMPLEX	CF INDUSTRIES NITROGEN, LLC	PN 13-037	Cooling Towers	99.009		0		Particulate matter, total (TPM)	drift eliminator	0.0005	%
IL-0114	CRONUS CHEMICALS, LLC	CRONUS CHEMICALS, LLC	13060007	Cooling Tower	61.012		0		Particulate matter, filterable (FPM)	drift eliminators; TDS of water not to exceed 2000 mg/l	0.0005	% LOSS FROM CIRC.
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	TOWER: ROLLING MILL/CASTER (NON-CONTACT) ID#15E	99.009		18000	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.	0.003	% DRIFT RATE
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	COOLING TOWER: CASTER SPRAYS (CONTACT) ID#15F	99.009		3500	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.	0.001	% DRIFT RATE
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	COOLING TOWER: ROLLING MILL (CONTACT) ID#15A	99.009		8000	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.	0.001	% DRIFT RATE
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	COOLING TOWER: LVD BOILER (CONTACT) ID#15G	99.009		2500	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.	0.005	% DRIFT RATE
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	COOLING TOWER: ROLLING MILL (CONTACT) ID#15B	99.009		4000	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRIFT RATE
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	COOLING TOWER: ROLLING MILL ID#15C (NONCONTACT)	99.009		81250	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS.	0.001	% DRIFT RATE

RBLC Search Results (PM - Cooling Tower)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
IN-0156	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	STEEL DYNAMICS, INC. - STRUCTURAL AND RAIL DIVISION	183-27145-00030	COOLING TOWER: #1 CAST ID#15D (CONTACT)	99.009		5000	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR; DO NOT USE CHROMIUM-BASED WATER TREATMENT CHEMICALS IN ANY OF THE COOLING TOWERS	0.001	% DRAFT RATE
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	141-31003-00579	TWO (2) COOLING TOWERS	99.009		170000	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATOR	0.0005	% DRIFT LOSS
IN-0167	MAGNETATION LLC	MAGNETATION LLC	181-32081-00054	COOLING TOWER	99.009		4600	GAL/MIN OF CIRCULATING WATER	Particulate matter, filterable (FPM)	DRIFT EMILINATORS	0.001	% MAXIMUM DRIFT RATE
IN-0173	MIDWEST FERTILIZER CORPORATION	MIDWEST FERTILIZER CORPORATION	129-33576-00059	TEN CELL EVAPORATIVE COOLING TOWER	99.009		147937	GPM	Particulate matter, filterable (FPM)	HIGH EFFICIENCY DRIFT ELIMINATORS	0.0005	% DRIFT LOSS
IN-0173	MIDWEST FERTILIZER CORPORATION	MIDWEST FERTILIZER CORPORATION	129-33576-00059	SIX CELL EVAPORATIVE COOLING TOWER	99.009		88762	GPM	Particulate matter, filterable (FPM)	HIGH EFFICIENCY DRIFT ELIMINATORS	0.0005	% DRIFT LOSS
IN-0179	OHIO VALLEY RESOURCES, LLC	OHIO VALLEY RESOURCES, LLC	147-32322-00062	TWO (2) COOLING TOWERS	99.009		179720	GPM, COMBINED	Particulate matter, filterable (FPM)	HIGH EFFICIENCY DRIFT ELIMINATORS	0.0005	% DRIFT
IN-0180	MIDWEST FERTILIZER CORPORATION	MIDWEST FERTILIZER CORPORATION	129-33576-00059	TEN CELL EVAPORATIVE COOLING TOWER	99.009		147937	GPM	Particulate matter, filterable (FPM)	HIGH EFFICIENCY DRIFT ELIMINATORS	0.0005	% DRIFT LOSS
IN-0180	MIDWEST FERTILIZER CORPORATION	MIDWEST FERTILIZER CORPORATION	129-33576-00059	SIX CELL EVAPORATIVE COOLING TOWER	99.009		88762	GPM	Particulate matter, filterable (FPM)	HIGH EFFICIENCY DRIFT ELIMINATORS	0.0005	% DRIFT LOSS
IN-0255	NUCOR STEEL	NUCOR STEEL	107-36834-00038	HOT MILL CONTACT COOLING TOWER	99.999	NA	25000	GAL/MIN	Particulate matter, filterable (FPM)	DRIFT ELIMINATORS	0.001	% DRIFT
KS-0029	THE EMPIRE DISTRICT ELECTRIC COMPANY	THE EMPIRE DISTRICT ELECTRIC COMPANY	C-12987	Mechanical draft cooling tower	99.009		0		Particulate matter, total (TPM)	high efficiency drift eliminators (integral part of the design)	0.0005	% DRIFT RATE
MI-0400	WOLVERINE POWER	WOLVERINE POWER SUPPLY COOPERATIVE, INC.	317-07	Cooling Tower (EUCOOLINGTWR)	99.009		0		Particulate matter, filterable (FPM)	Drift eliminators	0.0005	%
MI-0401	MIDLAND POWER STATION	VC ENERGY LLC MIDLAND POWER STATION LLC	24-11B	Cooling Tower	99.009		0		Particulate matter, filterable (FPM)	High efficiency drift eliminators	0.0005	% DRIFT LOSS RATE
MI-0427	FILER CITY STATION	FILER CITY STATION LIMITED PARTNERSHIP	66-17	EUCOOLTWR (Cooling Tower--Wet Mechanical Drift)	99.009		0		Particulate matter, filterable (FPM)	Mist/Drift Eliminators	0.0006	%
MS-0092	EMBERCLEAR GTL MS	EMBERCLEAR GTL MS LLC	0040-00055	Cooling tower, Induced draft	99.009		1420	GAL/MIN	Particulate matter, total (TPM)	high efficiency drift eliminators	0.001	%

RBLC Search Results (PM - Cooling Tower)

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	PERMIT NUM	PROCESS NAME	PROCCESS TYPE	PRIMARY FUEL	THROUGH-PUT	THROUGH-PUT UNIT	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT
*NE-0059	AGP SOY	AG PROCESSING INC., A COOPERATIVE	CP14-007	Cooling Tower	99.009		360000	gal/hr	Particulate matter, total (TPM)	drift loss design specification and TDS concentration limit	0.0005	%
*SC-0193	MERCEDES BENZ VANS, LLC	MERCEDES BENZ VANS, LLC	0560-0385-CA	Cooling Towers	41.002		484900	gal/hr	Particulate matter, total (TPM)		0.001	% DRIFT RATE
TX-0551	PANDA SHERMAN POWER STATION	PANDA SHERMAN POWER LLC	PSDTX1198	Cooling tower	99.009		0		Particulate matter, total (TPM)	Drift eliminators	0.0005	% DRIFT
TX-0552	WOLF HOLLOW POWER PLANT NO. 2	STARK POWER GENERATION II HOLDINGS, LLC	PSDTX1110	Cooling tower	99.009		0		Particulate matter, total (TPM)	Drift eliminators	0.0005	% DRIFT
TX-0553	LINDALE RENEWABLE ENERGY	LINDALE RENEWABLE ENERGY LLC	PSDTX1184	Cooling tower	99.009		0		Particulate matter, total (TPM)	Drift eliminators	0.0005	% DRIFT
*TX-0657	BEAUMONT GAS TO GASOLINE PLANT	NATGASOLINE LLC	PSDTX1340 AND 107764	cooling tower	50.002		99000000	gallons/yr	Particulate matter, total (TPM)	Drift eliminators (limit 0.001 % drift)and monitoring of TDS or conductivity Emission Limit for PM is 82.57 tpy Emission Limit for PM10 is 1.28 tpy Emission Limit for PM2.5 is 0.03 tpy	0.001	% DRIFT
*TX-0864	EQUISTAR CHEMICALS CHANNELVIEW COMPLEX	EQUISTAR CHEMICALS, LP	PSDTX1542, GHGPSDTX 183	Cooling Tower	99.009		0		Particulate matter, total (TPM)	drift eliminators	0.005	% DRIFT
WI-0252	SPECIALTY MINERALS INC. - SUPERIOR	SPECIALTY MINERALS INC. (SMI)	09-DCF-251	P30 - DIRECT CONTACT SCRUBBER WITH COOLING TOWER	62.999		515	GAL/MIN	Particulate Matter (PM)	HIGH EFFICIENCY MIST / DRIFT ELIMINATOR (WITH ADDITIONAL LAYER), LIMITS ON % SOLIDS	0.0005	% CIRCULATION DRIFT
WI-0252	SPECIALTY MINERALS INC. - SUPERIOR	SPECIALTY MINERALS INC. (SMI)	09-DCF-251	P40, P50 - COOLING TOWERS	62.999		700	GAL/MIN	Particulate Matter (PM)	HIGH EFFICIENCY MIST / DRIFT ELIMINATORS (W/ ADDITIONAL LAYER)	0.0005	% CIRCULATION DRIFT
WI-0252	SPECIALTY MINERALS INC. - SUPERIOR	SPECIALTY MINERALS INC. (SMI)	09-DCF-251	P60 - COOLING TOWER	62.999		200	GAL/MIN	Particulate Matter (PM)	HIGH EFFICIENCY MIST / DRIFT ELIMINATORS (W/ ADDITIONAL LAYER); DISSOLVED SOLIDS LIMIT	0.0005	% CIRCULATION DRIFT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

10-20-2000 Rev. 0
12-5-2003 Rev. 1

Equipment or Process: Reactor with Atmospheric Vent [a)]

	Criteria Pollutants					
Rating/Size	**VOC/ODC**	**NOx**	**SOx**	**CO**	**PM_{10}**	**Inorganic**
All	- Carbon Adsorber; or - Afterburner (VOC Only); or - Refrigerated Condenser; or - Scrubber with Approved Liquid Waste Disposal (VOC only) (1990)					

a) Also see “Resin Manufacturing” and “Surfactant Manufacturing”. (12-5-2003)

* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

BACT Determination Detail

Category

Source Category:	Storage Tanks: 20,000 gallons or greater
SIC Code	3795
NAICS Code	493

Emission Unit Information

Manufacturer:	
Type:	
Model:	
Equipment Description:	
Capacity / Dimentions	
Fuel Type	Other
Multiple Fuel Types	

Operating Schedule (hours/day)/(days/week)/ (weeks/year)e	Variable (/ /)
Function of Equipment	Store organic liquid prior to distribution to customers

Project / Permit Information

Application/Permit No.:	353730
Application Completeness Date:	
New Construction/Modification:	New Construction
ATC Date:	09-09-1999
PTO Date:	
Startup Date:	01-31-2000
Technology Status:	BACT Determination
Source Test Available:	No
Source Test Results:	

Facility / District Information

Facility Name:	Van Waters and rogers
Facility Zip Code:	90040

Facility County:	Los Angeles
District Name:	South Coast AQMD
District Contact:	Martin Kay
Contact Phone No.:	909-396-3115
Contact E-Mail:	mkay@aqmd.gov

Notes

Notes:	Permit limit: Maximum volume filled into all the storge tanks at the facility shall not exceed 6,327,000 gallons in any one year. Materials with an initial boiling point greater than 150 C, or vapor pressure less than 0.10 psia at 70 F are not counted towards the 6,327,000 gal/year throughput limit. No carcinogenic materials as identified in AQMD Rule 1401 shall be stored in the tanks. The vapor pressure of storage tanks 1-15 shall not exceed that of hexane, except for exempt compounds. The vapor pressure of storage tanks P,Q,T not to exceed that of methanol. All 18 organic storage tanks will be vented to the thermal oxidizer. The assumed overall efficiency of the thermal oxidizer is 95% VOC control. A temp of not less than 1,400 F will be maintained in the thermal oxidizer when the equipment it serves is in operation, and no liquid wastes will be burned in the thermal oxidizer.

Report Error In Determination

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline

Source Category

Source:	***Storage Tank - Fixed Roof, Organic Liquids***	Revision:	***2***
		Document #:	***167.3.1***
Class:	***≥20,000 Gallons***	Date:	***03/03/95***

Determination

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice	TYPICAL TECHNOLOGY
POC	1. *n/d* 2. *Vapor recovery system w/ an overall system efficiency ≥98%*[a,T]	1. *n/d* 2. *Thermal Incinerator; or Carbon Adsorber; or Refrigerated Condenser; or BAAQMD approved equivalent*[a,T]
NOx	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
SO_2	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
CO	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
PM_{10}	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
NPOC	1. *n/d* 2. *Vapor recovery system w/ an overall system efficiency ≥98%*[a,T]	1. *n/d* 2. *Carbon Adsorber; or Refrigerated Condenser; or BAAQMD approved equivalent*[a,T]

References

a. BAAQMD
T. TBACT

Section I: AQMD BACT Determinations

Application No.: 353730

Equipment Category – Storage Tank - Fixed Roof

1. GENERAL INFORMATION

DATE: 10/1/99

A. MANUFACTURER:

B. TYPE: Storage Tank

C. MODEL:

D. STYLE:

E. APPLICABLE AQMD REGULATION XI RULES: Rule 463

F. COST: $ ( ) SOURCE OF COST DATA:

G. OPERATING SCHEDULE: 4 HRS/DAY 1 DAYS/WK 19 WKS/YR

2. EQUIPMENT INFORMATION

APP. NO.: 353730

A. FUNCTION: To store organic liquids prior to distribution to customers.

B. SIZE/DIMENSION/CAPACITY:

The applicant recently obtained permits to construct 18 organic liquid storage tanks. The size and/or capacity of the storage tanks is provided below.

A/Ns 353730-2, 353736, 353738, and 353740: each storage tank = 12'-6" Dia. x 35'-0" H, 30,000 gallons capacity

A/Ns 353741-4, 353746-7, 353749, 353751-2: each storage tank = 10'-2" Dia. x 20'-0" H., 12,000 gallons capacity

A/Ns 353753-5: each storage tank = 3,000 gallons capacity

C. BLOWERS:

D. TOTAL FLOW RATE: scfm

E. MATERIAL STORED/PROCESSED/HANDLED: Various commonly used organic liquids (e.g., mineral spirits and styrene)

F. THROUGHPUT/PROCESS RATE/USAGE RATE:

Maximum volume filled into all the storage tanks at the facility shall not exceed 6,327,000 gallons of volatile organic liquids in any one year.

3. COMPANY INFORMATION

APP. NO.: 353730

A. NAME: Van Waters & Rogers

B. ADDRESS: 2600 S. Garfield Avenue

CITY: Commerce STATE: CA ZIP: 90040

C. CONTACT PERSON: Nick Gardner

D. PHONE NO.: (323)881-7158

4. PERMIT INFORMATION

APP. NO.: 353730

A. AGENCY: SCAQMD

B. AGENCY CONTACT PERSON: Belinda C. Wan

C. PHONE NO.: (909)396-2532

D. PERMIT TO CONSTRUCT INFORMATION: P/C NO.: 353730 ISSUANCE DATE: 9/9/1999

4. PERMIT INFORMATION

APP. NO.: 353730

E. START-UP DATE: 1/31/00

F. PERMIT TO OPERATE INFORMATION: P/O NO.: ISSUANCE DATE:

5. EMISSION INFORMATION

APP. NO.: 353730

A. PERMIT

A1. PERMIT LIMIT:

(1) The maximum volume of organic liquids filled into all the storage tanks at the facility shall not exceed 6,327,000 gallons in any one year. Materials with an initial boiling point greater than 150 degrees Centigrade, or vapor pressure less than 0.10 psia at 70 degrees Fahrenheit are not counted towards the 6,327,000 gallons/year facility throughput limit.

(2) The vapor pressure of the organic liquids stored in storage tanks 1-15 shall not exceed that of hexane, except for exempt compounds as defined in Rule 102.

(3) The vapor pressure of the organic liquids stored in storage tanks P, Q, and T shall not exceed that of methanol, except for exempt compounds as defined in Rule 102.

(4) The maximum VOC emissions from the facility shall not exceed 4 tons/year.

(5) No carcinogenic materials as identified in AQMD Rule 1401 (as amended March 12, 1999) shall be stored in the tanks.

A2. BACT/LAER DETERMINATION: Afterburner

B. CONTROL TECHNOLOGY

B1. MANUFACTURER/SUPPLIER: John Zink

B2. TYPE: Thermal Oxidizer - Direct Flame

B3. DESCRIPTION:

Thermal Oxidizer, John Zink, Model ZCS-1-4-20-X-3/10, 3'-8" Dia. x 14'-0" H., Natural Gas Fired, 3.6 MMBtu/hr, With Two Burners, One Burner for the Passive Sources and one Burner for the Blower-Assisted Sources

B4. CONTROL EQUIPMENT PERMIT APPLICATION DATA: P/C NO.: 353767 ISSUANCE DATE: 9/9/1999

P/O NO.: ISSUANCE DATE:

B5. WASTE AIR FLOW TO CONTROL EQUIPMENT: FLOW RATE:

ACTUAL CONTAMINANT LOADING: BLOWER HP: 20 HP

B6. WARRANTY:

B7. PRIMARY POLLUTANTS: VOC

B8. SECONDARY POLLUTANTS: Combustion contaminants

B9. SPACE REQUIREMENT:

B10. LIMITATIONS:

B11. LOCATION OF PRIOR DEMONSTRATION & AGENCY:

FACILITY:

CONTACT PERSON: PHONE NO.:

AGENCY:

ADDRESS:

CONTACT PERSON: PHONE NO.:

5. EMISSION INFORMATION

APP. NO.: 353730

B12. OPERATING HISTORY:

B13. SOURCE TEST/PERFORMANCE DATA ANALYSIS:

DATE OF SOURCE TEST: CAPTURE EFFICIENCY:

DESTRUCTION EFFICIENCY: OVERALL EFFICEINCY:

PERFORMANCE DATA:

B14. SOURCE TEST CONDITIONS/PERFORMANCE DATA:

C. COST

C1. CONTROL EQUIPMENT COST: ☐ CHECK IF INSTALLATION COST IS INCLUDED IN CAPITAL COST

CAPITAL: $ INSTALLATION: $ ( ) SOURCE OF COST DATA:

C2. ANNUAL OPERATIONAL/MAINTENANCE COST: $ ( ) SOURCE OF COST DATA:

D. DEMONSTRATION OF COMPLIANCE

D1. STAFF PERMFORMING FIELD EVALUATION:

ENGINEER'S NAME: INSPECTOR'S NAME: DATE:

D2. COMPLIANCE DEMONSTRATION:

D3. VARIANCE: NO. OF VARIANCES: DATES:

CAUSES:

D4. VIOLATION: NO. OF VIOLATIONS: DATES:

CAUSES:

D5. FREQUENCY OF MAINTENANCE:

6. COMMENTS

APP. NO.: 353730

The applicant is planning to install 18 organic liquid storage tanks at this facility. All 18 organic liquid storage tanks will be vented to the thermal oxidizer included in application number 353767. The assumed overall efficiency of the thermal oxidizer is 95% VOC control. A temperature of not less than 1400 degrees Fahrenheit will be maintained in the thermal oxidizer when the equipment it serves is in operation, and no liquid wastes will be burned in the thermal oxidizer.

BACT Determination Detail

Category

Source Category:	Storage Tanks: External Floating Roof
SIC Code	2911
NAICS Code	

Emission Unit Information

Manufacturer:	
Type:	
Model:	
Equipment Description:	recovered oil storage tank, external floating roof with dome
Capacity / Dimentions	101,000 barrels
Fuel Type	None-applicable
Multiple Fuel Types	

Operating Schedule (hours/day)/(days/week)/ (weeks/year)e	Variable (/ /)
Function of Equipment	organic liquid storage

Project / Permit Information

Application/Permit No.:	22722
Application Completeness Date:	
New Construction/Modification:	New Construction
ATC Date:	08/24/2011
PTO Date:	
Startup Date:	
Technology Status:	BACT Determination
Source Test Available:	No
Source Test Results:	

Facility / District Information

Facility Name:	chevron products co
Facility Zip Code:	94802

Facility County:	Contra Costa
District Name:	Bay Area AQMD
District Contact:	greg solomon
Contact Phone No.:	415 749 4715
Contact E-Mail:	gsolomon@baaqmd.gov

Notes

Notes:	This BACT determination is achieved in practice since the south coast has a rule 1178, which requires domes on external floating roof tanks storing materials with greater than or equal to 3.0 psia and greater than 19,815 gallons.

Report Error In Determination

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guideline

Source Category

Source:	***Storage Tank - Internal Floating Roof, Organic Liquids***	Revision:	***2***
		Document #:	***167.4.1***
Class:	All	Date:	***03/03/95***

Determination

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice	TYPICAL TECHNOLOGY
POC	1. *Vapor recovery system w/ an overall system efficiency ≥98%*[a,T] 2. *BAAQMD Approved roof w/ liquid mounted primary seal and zero gap secondary seal, all meeting design criteria of Reg. 8, Rule 5. Also, no ungasketed roof penetrations, no slotted pipe guide pole unless equipped with float and wiper seals, and no adjustable roof legs unless fitted w/ vapor seal boots or equivalent*[a,T]	1. *Thermal Incinerator; or Carbon Adsorber; or Refrigerated Condenser; or BAAQMD approved equivalent*[a,T] 2. *BAAQMD Approved Roof and Seal Design*[a,T]
NOx	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
SO_2	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
CO	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
PM_{10}	1. *n/a* 2. *n/a*	1. *n/a* 2. *n/a*
NPOC	1. *Vapor recovery system w/ an overall system efficiency ≥98%*[a,T] 2. *Same as for POC above*	1. *Carbon Adsorber; or Refrigerated Condenser; or BAAQMD approved equivalent*[a,T] 2. *BAAQMD Approved Roof and Seal Design*[a,T]

References

a. BAAQMD
T. TBACT

Part B, Section 1 - SCAQMD BACT Determination

Source Type: **Major/LAER**

Application No.: **535483, 535485, 544857 & 544859**

Equipment Category: **Storage Tank**

Equipment Subcategory: **External Floating Roof**

Date: **February 1, 2019**

1. EQUIPMENT INFORMATION

A. MANUFACTURER: Custom	B. MODEL: Custom
C. DESCRIPTION: Domed external floating roof, welded shell, Nos. 15, 2625, 2640 & 2643	
D. FUNCTION: Phillips 66 Company is a refinery which owns and operates external floating roof storage tanks for crude oil, gas oil, mixed naphtha and wastewater storage.	
E. SIZE/DIMENSIONS/CAPACITY: A/N 535483: 117' Dia. x 40' H., 79,000 BBL (3,318,000 Gal.) Mixed Naphtha A/N 535485: 165' Dia. x 48' H., 165,252 BBL (6,940,584 Gal.) Gas Oil A/N 544857: 260' Dia. x 65' H., 615,000 BBL (25,830,000 Gal.) Crude Oil A/N 544859: 44' Dia. x 51' H., 14,000 BBL (588,000 Gal.) Wastewater	
COMBUSTION SOURCES	
F. MAXIMUM HEAT INPUT: N/A	
G. BURNER INFORMATION	

TYPE	INDIVIDUAL HEAT INPUT	NUMBER
N/A		Number of burners

H. PRIMARY FUEL: N/A	I. OTHER FUEL: N/A
J. OPERATING SCHEDULE: Hours 24 Days 7 Weeks 52	
K. EQUIPMENT COST:	
L. EQUIPMENT INFORMATION COMMENTS: Storage tanks are equipped with geodesic dome cover, double-deck floating roof, category A metallic shoe primary seal, category A rim-mounted secondary seal and guide pole gasketed sliding cover with wiper unslotted.	

2. COMPANY INFORMATION

A. COMPANY: Phillips 66 Company	B. FAC ID: 171109
C. ADDRESS: 1520 E. Sepulveda Blvd. CITY: Carson STATE: CA ZIP: 90745	D. NAICS CODE: 324110
E. CONTACT PERSON: Marshall Waller	F. TITLE: Env. Engineer
G. PHONE NO.: (310) 522-8039	H. EMAIL:

3. PERMIT INFORMATION

A. AGENCY: SCAQMD	B. APPLICATION TYPE: NEW CONSTRUCTION
C. SCAQMD ENGINEER: Thomas Truppi	
D. PERMIT INFORMATION: PC ISSUANCE DATE: 8/30/13 P/O NO.: G17750, G17751, G51127 & G51128 PO ISSUANCE DATE: 3/15/2018	
E. START-UP DATE: 4/4/2016	
F. OPERATIONAL TIME: 2+ years	

4. EMISSION INFORMATION

A. BACT EMISSION LIMITS AND AVERAGING TIMES:

	VOC	NOx	SOx	CO	PM OR PM_{10}	INORGANIC
BACT Limit						
Averaging Time						
Correction						

B. OTHER BACT REQUIREMENTS:

C. BASIS OF THE BACT/LAER DETERMINATION: Achieved in Practice/New Technology

D. EMISSION INFORMATION COMMENTS:

5. CONTROL TECHNOLOGY

A. MANUFACTURER: Custom	B. MODEL: Custom
C. DESCRIPTION: Use of Geodesic Dome Cover, Floating Roof Pontoon (Double Deck), Primary Seal with Category A Metallic Shoe, Secondary Seal with Category A wiper type, and Guidepole with gasketed sliding cover with wiper unslotted.	
D. SIZE/DIMENSIONS/CAPACITY: N/A	
E. CONTROL EQUIPMENT PERMIT INFORMATION: APPLICATION NO. same PC ISSUANCE DATE: same PO NO.:same PO ISSUANCE DATE: same	
F. REQUIRED CONTROL EFFICIENCIES: .	

CONTAMINANT	OVERALL CONTROL EFFICIENCY	CONTROL DEVICE EFFICIENCY	COLLECTION EFFICIENCY
VOC	___%	___%	___%
NOx	___%	___%	___%
SOx	___%	___%	___%
CO	___%	___%	___%
PM	___%	___%	___%
PM_{10}	___%	___%	___%
INORGANIC	___%	___%	___%

G. CONTROL TECHNOLOGY COMMENTS

6. DEMONSTRATION OF COMPLIANCE

A. COMPLIANCE DEMONSTRATED BY: Maintenance, Inspection and Recordkeeping

B. DATE(S) OF SOURCE TEST: An appropriate size parameter such as rated product throughput, usable volume, and/or one more characteristic dimensions.

C. COLLECTION EFFICIENCY METHOD: N/A

D. COLLECTION EFFICIENCY PARAMETERS: N/A

E. SOURCE TEST/PERFORMANCE DATA:N/A

F. TEST OPERATING PARAMETERS AND CONDITIONS: N/A

G. TEST METHODS (SPECIFY AGENCY): N/A

H. MONITORING AND TESTING REQUIREMENTS: Monitoring monthly throughput permitted limit. This requirement is included for information only; it is not related to the dome cover BACT requirement.

I. DEMONSTRATION OF COMPLIANCE COMMENTS: Enter comments for additional information for Demonstration of Compliance.

7. ADDITIONAL SCAQMD REFERENCE DATA

A. BCAT: 248919	B. CCAT: Click here to enter text.	C. APPLICATION TYPE CODE: 60
D. RECLAIM FAC? YES ☒ NO ☐	E. TITLE V FAC: YES ☒ NO ☐	F. SOURCE TEST ID(S): N/A
G. SCAQMD SOURCE SPECIFIC RULES: Click here to enter text.		
H. HEALTH RISK FOR PERMIT UNIT		

H1. MICR: Click here to enter text.	H2. MICR DATE: Click here to enter a date.	H3. CANCER BURDEN: Click here to enter text.	H4. CB DATE: Click here to enter a date.
H5: HIA: Click here to enter text.	H6. HIA DATE: Click here to enter a date.	H7. HIC: Click here to enter text.	H8. HIC DATE: Click here to enter a date.

TCEQ Table 7(d) – Internal Floating Roof Storage Tank Summary

Texas Commission on Environmental Quality
Table 7(d)
Internal Floating Roof Storage Tank Summary

Applicant's Full Name			
TPC Group LLC			
I. Tank Identification *(Use a separate form for each tank)*.			
Location *(indicate on plot plan and provide coordinates)*			
Tank No.:Tank2D6			
Emission Point No. (EPN) *(from flow diagram)*:	TK-2D6		
Facility Identification Number (FIN):	TK-2D6		
Control Identification Number (CIN):			
Status of the tank			
☒ New Tank	☐ Altered Tank	☐ Relocation	☐ Change of Service
Previous Permit No.:			
Previous Permit by Rule No.:			
Previous Exemption No.:			
II. Tank Physical Characteristics			
Dimensions of the Tank			
Shell Height (*ft.*):			
Diameter (*ft.*):	75		
Normal Capacity or Tank Volume (*gallons*):	130,183,200		
Turnovers per year:			
Net Throughput (*gallons/year*):	130,183,200		
Maximum Pumping Rate *(gallons/hour[1])*:	22,000		
Self-Supporting Roof:	☒ YES ☐ NO		
Numbers of Columns:			
Column Diameter *(ft.)*:			

[1] *Use the higher of the maximum fill rate or maximum withdrawal rate.*

Texas Commission on Environmental Quality
Table 7(d)
Internal Floating Roof Storage Tank Summary

II. Tank Physical Characteristics *(continued)*		
Shell /Roof and Paint Characteristics		
Shell Condition		
☒ Light Rust	☐ Dense Rust	☐ Gunite Lining
Shell Color/Shade		
☐ White/White	☒ Aluminum/Specular	☐ Aluminum/Diffuse
☐ Gray/Light	☐ Gray/Medium	☐ Red/Primer
☐ Other *(Describe)*:		
Shell Condition		
☒ Good	☐ Poor	
Roof Color/Shade		
☐ White/White	☐ Aluminum/Specular	☐ Aluminum/Diffuse
☐ Gray/Light	☐ Gray/Medium	☐ Red/Primer
☐ Other *(Describe)*:		
Roof Condition		
☒ Good	☐ Poor	
Rim-Seal System		
Primary Seal		
☒ Vapor-mounted	☐ Liquid-mounted	☐ Mechanical Shoe
Secondary Seal:	☒ YES ☐ NO	
Deck Characteristic		
Deck Type		
☐ Bolted	☒ Welded	
Deck Construction *(Bolted Tanks Only)*		
☐ Continuous Sheet Construction 5 ft. wide		
☐ Continuous Sheet Construction 6 ft. wide		
☐ Continuous Sheet Construction 7 ft. wide		
☐ Rectangular Panel Construction 5 X 7.5 ft. wide		
☐ Rectangular Panel Construction 5 X 12 ft. wide		

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Table 7(d)
Internal Floating Roof Storage Tank Summary

II. Tank Physical Characteristics *(continued)*			
Deck Seam Length *(Bolted Tanks Only) (ft.)*			
Roof Fitting Loss Factor (lb-mole/year)			
Based Upon			
☐ Typical Fittings	☐ Controlled Fittings	☐ Actual Fittings	
Complete Section IV, Fittings Information, to record fittings count used to calculate the roof fitting loss factor.			
III. Liquid Properties of Stored Material			
Chemical Category			
☒ Organic Liquids	☐ Petroleum Distillates	☐ Crude Oils	
Single *(complete Section III.1.* or Multi-Component Liquid *(complete Section III.2.)*			
☒ Single	☐ Multiple		
1. Single Component Information			
Chemical Name:	Iso-octene		
Chemical Abstract Service (CAS) No.			
Average Liquid Surface Temperature (°F):			
True Vapor Pressure at Average Liquid Surface Temperature (*psia*):			
Liquid Molecular Weight:			
2. Multiple Component Information			
Mixture Name:			
Average Liquid Surface Temperature (°F):			
Minimum Liquid Surface Temperature (°F):			
Maximum Liquid Surface Temperature (°F):			
True Vapor Pressure at Average Liquid Surface Temperature (*psia*):			
True Vapor Pressure at Minimum Liquid Surface Temperature (*psia*):			
True Vapor Pressure at Maximum Liquid Surface Temperature *(psia*):			
Liquid Molecular Weight:			
Vapor Molecular Weight:			

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Table 7(d)
Internal Floating Roof Storage Tank Summary

III. Liquid Properties of Stored Material				
Chemical Components Information *(Below)*				
Chemical Name	**CAS Number**	**Percent of Total Liquid Weight *(typical)***	**Percent of Total Vapor Weight *(typical)***	**Molecular Weight**

Texas Commission on Environmental Quality
Table 7(d)
Internal Floating Roof Storage Tank Summary

IV. Fitting Information				
Fitting Type[(1)]	**Fitting Status**	**Quantity**	**Deck Fitting Loss Factor K_F[(2)]**	**Quantity x K_F**
Access Hatch	Bolted Cover, Gasketed	1	19.2	
Access Hatch	Unbolted Cover, Ungasketed			
Access Hatch	Unbolted Cover, Gasketed			
Column Well	Round Pipe - Sliding Cover, Ungasketed			
Column Well	Round Pipe - Sliding Cover, Gasketed			
Column Well	Round Pipe - Flex. Fabric Sleeve Seal			
Column Well	Built-Up Col. - Sliding Cover, Ungask.			
Column Well	Built-Up Col. - Sliding Cover, Gasketed			
Unslotted Guidepole and Well	Sliding Cover, Ungasketed			
Unslotted Guidepole and Well	Sliding Cover, Ungasketed w/Pole Sleeve			
Unslotted Guidepole and Well	Sliding Cover, Gasketed			
Unslotted Guidepole and Well	Sliding Cover, Gasketed w/Pole Wiper			
Unslotted Guidepole and Well	Sliding Cover, Gasketed w/Pole Sleeve			
Slotted Guidepole/Sample Well	Ungasketed or Gasketed Sliding Cover	1	516	
Slotted Guidepole/Sample Well	Ungask. or Gask. Sliding Cover w/Float			
Slotted Guidepole/Sample Well	Gasketed Sliding Cover, w/Pole Wiper			
Slotted Guidepole/Sample Well	Gasketed Sliding Cover, w/Pole Sleeve			
Slotted Guidepole/Sample Well	Gasketed Sliding Cover, w/Pole Wiper and Sleeve			
Slotted Guidepole/Sample Well	Gasketed Sliding Cover, w/Float and Pole Wiper			
Slotted Guidepole/Sample Well	Gasketed Sliding Cover, w/Float, Pole Wiper, and Pole Sleeve			
Slotted Guidepole/Sample Well	Flexible Enclosure			

Note (1): Document any fittings not listed above in blank rows and include in total loss factor.
Note (2): Refer to current EPA AP-42 Chapter 7 for deck fitting loss factors (K_F).

Texas Commission on Environmental Quality
Table 7(d)
Internal Floating Roof Storage Tank Summary

IV. Fitting Information *(continued)*				
Fitting Type[(1)]	**Fitting Status**	**Quantity**	**Deck Fitting Loss Factor K_F[(2)]**	**Quantity x K_F**
Automatic Gauge Float Well	Unbolted Cover, Ungasketed	1	168	
Automatic Gauge Float Well	Unbolted Cover, Gasketed			
Automatic Gauge Float Well	Bolted Cover, Gasketed			
Gauge Hatch/Sample Port	Gasketed, Weighted Mech. Actuation			
Gauge Hatch/Sample Port	Ungasketed, Weighted Mech. Actuation			
Gauge Hatch/Sample Port	Slit Fabric Seal, 10% Open Area	1	144	
Vacuum Breaker	Ungasketed, Weighted Mech. Actuation			
Vacuum Breaker	Gasketed, Weighted Mech. Actuation	1	74.4	
Deck Drain	Open			
Deck Drain	90% Closed			
Deck Drain	Stub Drain (1-inch Diameter)			
Deck Leg – Pontoon Area of Pontoon Roof	Ungasketed	16	32	
Deck Leg – Pontoon Area of Pontoon Roof	Gasketed			
Deck Leg – Pontoon Area of Pontoon Roof	Sock			
Deck Leg – Double Deck Roof and Center Area of Pontoon	Ungasketed	10	9.84	
Deck Leg – Double Deck Roof and Center Area of Pontoon	Gasketed			
Deck Leg – Double Deck Roof and Center Area of Pontoon	Sock			
Deck Leg or Hanger (no opening)	Fixed			
Rim Vent	Ungasketed, Weighted Mech. Actuation			
Rim Vent	Gasketed, Weighted Mech. Actuation			

Note (1): Document any fittings not listed above in blank rows and include in total loss factor.
Note (2): Refer to current EPA AP-42 Chapter 7 for deck fitting loss factors (K_F).

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Table 7(d)
Internal Floating Roof Storage Tank Summary

IV. Fitting Information *(continued)*				
Fitting Type[(1)]	**Fitting Status**	**Quantity**	**Deck Fitting Loss Factor K_F[(2)]**	**Quantity x K_F**
Ladder Well	Sliding Cover, Ungasketed			
Ladder Well	Sliding Cover, Gasketed			
Ladder-Guidepole Combo Well	Sliding Cover, Ungasketed			
Ladder-Guidepole Combo Well	Ladder Sleeve, Ungasketed Sliding Cover			
Ladder-Guidepole Combo Well	Ladder Sleeve, Gasketed Sliding Cover			
	Total deck fitting loss factor, lb-mole/year			783.47

Note (1): Document any fittings not listed above in blank rows and include in total loss factor.
Note (2): Refer to current EPA AP-42 Chapter 7 for deck fitting loss factors (K_F).