RPS

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March 23, 2012

FedEx No.:7933 7414 3859

Mr. Jeff Robinson
Chief, Air Permit Section
U.S. EPA Region 6, 6PD
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Application for PSD Air Quality Permit
Greenhouse Gas Emissions
KM Liquids Terminals LLC – Galena Park Terminal
Galena Park, Harris County
Customer Reference Number: CN603254707
Regulated Entity Number: RN100237452

Dear Mr. Robinson:

On behalf of KM Liquids Terminals LLC (KMLT), RPS is hereby submitting the enclosed application for a Prevention of Significant Deterioration (PSD) air quality permit for greenhouse gas (GHG) emissions from the proposed 100,000 barrel per day condensate splitter at the KMLT Galena Park Terminal. A New Source Review (NSR) permit application for the proposed projected was submitted to the Texas Commission on Environmental Quality (TCEQ) in February 2012. The proposed project is subject to Nonattainment New Source Review (NNSR) for volatile organic compounds (VOC) and oxides of nitrogen (NO_x), for which the TCEQ has an approved permitting program. The proposed project is also subject to PSD review for GHG, for which the TCEQ has not implemented a PSD permitting program. Therefore, this document constitutes an application from KMLT for the required U.S. Environmental Protection Agency (EPA) PSD GHG air quality permit. This application includes both routine and planned maintenance, startup, and shutdown (MSS) emissions.

We wish to thank you in advance for you consideration of this application. If you should have any questions during your review, please feel free to contact me at 832-239-8018 or Ms. Christina Harris of KMLT at 713-369-8760.

Sincerely,

RPS

Neal A. Nygaard
Manager, Houston Office

Enclosures

cc: Ms. Christina Harris, KM Liquids Terminals LLC, Houston, TX FedEx No. 7933 7416 7904

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Application for U.S. Environmental Protection Agency Greenhouse Gas Air Quality Permit

KM Liquids Terminals LLC
Galena Park Terminal
Galena Park, Harris County, Texas

RN100237452
CN603254707

March 2012

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Section 1
Introduction

KM Liquids Terminals LLC (KMLT) owns and operates a for-hire bulk petroleum terminal (Galena Park Terminal) located in Galena Park, Harris County, Texas that receives, stores, and transfers petroleum products and specialty chemicals. The facility consists of various storage tanks and associated piping, truck racks, rail car racks, barge docks, ship docks, and control equipment that are currently operated under New Source Review (NSR) Permit No. 2193, Permit-By-Rule (PBR), and Standard Permit.

1.1 Purpose of this Application

KMLT proposes to construct and operate a new 100,000 barrels per day (bbl/day) condensate splitter at the existing KMLT Galena Park Terminal, to be constructed in two 50,000 bbl/day phases. The proposed condensate splitter will consist of two trains which will each process 50,000 bbl/day of hydrocarbon condensate material to obtain products suitable for commercial use. Construction of the second 50,000 bbl/day train will commence within 18 months of completion of the first 50,000 bbl/day train.

A New Source Review (NSR) permit application for the proposed projected was submitted to the Texas Commission on Environmental Quality (TCEQ) in February 2012. Table 1-1 presents a summary of the proposed facility project emissions compared to Prevention of Significant Deterioration (PSD) applicability thresholds. The proposed project is subject to Nonattainment New Source Review (NNSR) for volatile organic compounds (VOC) and oxides of nitrogen (NO_x), for which the TCEQ has an approved permitting program. The proposed project is also subject to PSD review for greenhouse gases (GHG), for which the TCEQ has not implemented a PSD permitting program. Therefore, this document constitutes an application from KMLT for the required U.S. Environmental Protection Agency (EPA) PSD GHG air quality permit. This application includes both routine and planned maintenance, startup, and shutdown (MSS) emissions.

1.2 Application Organization

This application is organized into the following sections:

<u>Section 1</u> presents the application objectives and organization;

Section 2 contains TCEQ administrative Form PI-1;

Section 3 contains an Area Map showing the facility location, a Plot Plan showing the location of the facilities referenced in this submittal, and a Plot Plan for the proposed condensate splitter;

Section 4 contains a process description for the Galena Park Terminal;

Section 5 contains a discussion of the estimated emissions and a completed TCEQ Table 1(a);

Section 6 presents the Best Available Control Technology (BACT) analysis for the facilities included in this application;

Section 7 addresses applicability of the federal GHG PSD permitting requirements;

Appendix A contains detailed emissions calculations for routine operations;

Appendix B contains detailed emission calculations for MSS activities;

Appendix C contains the results of the RACT/BACT/LAER Clearinghouse (RBLC) search that supports the heater BACT analysis in Section 6; and

Appendix D contains a copy of the NNSR permit application submitted to the TCEQ in February 2012.

Table 1-1
Greenhouse Gas PSD Applicability Analysis Summary
KM Liquids Terminals LLC
Galena Park Terminal

	CO2			CH4			N20			CO2e		
	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change
EPN	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
F-101	-	52,730	52,730	-	1	1	-	0	0	-	52,782	52,782
F-102	-	42,702	42,702	-	1	1	-	0	0	-	42,744	42,744
F-201	-	52,730	52,730	-	1	1	-	0	0	-	52,782	52,782
F-202	-	42,702	42,702		1	1		0	0		42,744	42,744
FL-101	-	78	78	-	0	0	-	0	0	-	78	78
FUG	-	-	-	-	8	8	-	-	-	-	163	163
MAR-VCU	-	3,042	3,042	-	0	0	-	0	0	-	3,052	3,052
MSS	-	7,561	7,561	-	0	0	-	0	0	-	7,599	7,599
Project Increase (tpy)			***201,546***			***11***			***0***			***201,945***
Netting Threshold (tons)			-			-			-			***75,000***
Netting Required (Yes/No)			-			-			-			***Yes***
Contemporaneous Period Change (tons)			-			-			-			***> 75,000***
Significant Modification Threshold (tons)			-			-			-			***75,000***
Federal Revew Required (Yes/No)			-			-			-			***Yes***

Notes:

Section 2
Administrative Forms

This section contains the following TCEQ forms:

- Form PI-1, General Application for Air Preconstruction Permits and Amendments

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

Important Note: The agency **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued *and* no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to www.tceq.texas.gov/permitting/central_registry/guidance.html.

I. Applicant Information		
A. Company or Other Legal Name: KM Liquids Terminals LLC		
Texas Secretary of State Charter/Registration Number (*if applicable*):		
B. Company Official Contact Name: Ms Christina Harris		
Title: Compliance Assurance Manager		
Mailing Address: 500 Dallas St., Suite 1000		
City: Houston	State: TX	ZIP Code: 77002
Telephone No.: 713-205-1233	Fax No.:	E-mail Address: Christina_Harris@kindermorgan.com
C. Technical Contact Name: Mr. Neal A. Nygaard		
Title: Manager, Houston Office		
Company Name: RPS		
Mailing Address: 14450 JFK Blvd., Suite 400		
City: Houston	State: TX	ZIP Code: 77032
Telephone No.: 832-239-8018	Fax No.: 281-987-3500	E-mail Address: nygaardn@rpsgroup.com
D. Site Name: Galena Park Terminal		
E. Area Name/Type of Facility: Condensate Splitter	☒ Permanent ☐ Portable	
F. Principal Company Product or Business: Bulk Liquids Terminal		
Principal Standard Industrial Classification Code (SIC): 4226		
Principal North American Industry Classification System (NAICS):		
G. Projected Start of Construction Date: 1/1/2013		
Projected Start of Operation Date: 1/1/2014		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: 906 Clinton Drive		
City/Town: Galena Park	County: Harris	ZIP Code: 77547
Latitude (nearest second):	Longitude (nearest second):	

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

I. Applicant Information (continued)	
I. Account Identification Number (leave blank if new site or facility): HG-0262-H	
J. Core Data Form.	
Is the Core Data Form (Form 10400) attached? If *No*, provide customer reference number and regulated entity number (complete K and L).	☐ YES ☒ NO
K. Customer Reference Number (CN): CN603254707	
L. Regulated Entity Number (RN): RN100237452	
II. General Information	
A. Is confidential information submitted with this application? If *Yes*, mark each **confidential** page **confidential** in large red letters at the bottom of each page.	☐ YES ☒ NO
B. Is this application in response to an investigation or enforcement action? If *Yes*, attach a copy of any correspondence from the agency.	☐ YES ☒ NO
C. Number of New Jobs: 15	
D. Provide the name of the State Senator and State Representative and district numbers for this facility site:	
Senator: Mario Gallegos	District No.: 6
Representative: Ana Hernandez Luna	District No.: 143
III. Type of Permit Action Requested	
A. Mark the appropriate box indicating what type of action is requested. Initial ☒ Amendment ☐ Revision (30 TAC 116.116(e)) ☐ Change of Location ☐ Relocation ☐	
B. Permit Number (if existing):	
C. Permit Type: Mark the appropriate box indicating what type of permit is requested. *(check all that apply, skip for change of location)* Construction ☒ Flexible ☐ Multiple Plant ☐ Nonattainment ☐ Prevention of Significant Deterioration ☒ Hazardous Air Pollutant Major Source ☐ Plant-Wide Applicability Limit ☐ Other:____________________	
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with 30 TAC 116.315(c).	☐ YES ☒ NO

Texas Commission on Environmental Quality
Form PI-1 General Application for Air Preconstruction Permit and Amendment

III. Type of Permit Action Requested (continued)		
E. Is this application for a change of location of previously permitted facilities? If Yes, complete III.E.1 - III.E.4.		☐ YES ☒ NO
1. Current Location of Facility (If no street address, provide clear driving directions to the site in writing.):		
Street Address:		
City:	County:	ZIP Code:
2. Proposed Location of Facility (If no street address, provide clear driving directions to the site in writing.):		
Street Address:		
City:	County:	ZIP Code:
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions? If *No*, attach detailed information.		☐ YES ☐ NO
4. Is the site where the facility is moving considered a major source of criteria pollutants or HAPs?		☐ YES ☐ NO
F. Consolidation into this Permit: List any standard permits, exemptions or permits by rule to be consolidated into this permit including those for planned maintenance, startup, and shutdown.		
List: Not Applicable		
G. Are you permitting planned maintenance, startup, and shutdown emissions? If *Yes*, attach information on any changes to emissions under this application as specified in VII and VIII.		☒ YES ☐ NO
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability)		
Is this facility located at a site required to obtain a federal operating permit? If *Yes*, list all associated permit number(s), attach pages as needed).		☒ YES ☐ NO ☐ To be determined
Associated Permit No (s.): O988		
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this application is approved. FOP Significant Revision ☒ FOP Minor ☐ Application for an FOP Revision ☐ To Be Determined ☐ Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☐ None ☐		

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

III. Type of Permit Action Requested (continued)		
H.	Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) *(continued)*	
2.	Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
GOP Issued ☐	GOP application/revision application submitted or under APD review ☐	
SOP Issued ☐	SOP application/revision application submitted or under APD review ☒	
IV. Public Notice Applicability		
A.	Is this a new permit application or a change of location application?	☒ YES ☐ NO
B.	Is this application for a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	☐ YES ☒ NO
C.	Is this an application for a major modification of a PSD, nonattainment, FCAA 112(g) permit, or exceedance of a PAL permit?	☒ YES ☐ NO
D.	Is this application for a PSD or major modification of a PSD located within 100 kilometers of an affected state?	☐ YES ☒ NO
If *Yes*, list the affected state(s).		
E.	Is this a state permit amendment application? If Yes, complete IV.E.1. – IV.E.3.	☐ YES ☒ NO
1.	Is there any change in character of emissions in this application?	☐ YES ☐ NO
2.	Is there a new air contaminant in this application?	☐ YES ☐ NO
3.	Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☐ NO
F.	List the total annual emission increases associated with the application (*list* **all** *that apply and attach additional sheets as needed*):	
Volatile Organic Compounds (VOC): 122.01 tpy		
Sulfur Dioxide (SO_2): 9.95 tpy		
Carbon Monoxide (CO): 76.98 tpy		
Nitrogen Oxides (NO_x): 15.94 tpy		
Particulate Matter (PM): 12.44 tpy		
PM $_{10}$ microns or less (PM_{10}): 12.44 tpy		
PM $_{2.5}$ microns or less ($PM_{2.5}$): 8.44 tpy		
Lead (Pb): NA		
Hazardous Air Pollutants (HAPs): > 5 tpy		
Other speciated air contaminants **not** listed above: CO_2e > 100,000 tpy		

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

V. Public Notice Information (complete if applicable)			
A. Public Notice Contact Name: Ms. Christina Harris			
Title: Compliance Assurance Manager			
Mailing Address: 500 Dallas St., Suite 1000			
City: Houston	State: TX	ZIP Code:	
B. Name of the Public Place: Galena Park Branch Library			
Physical Address (No P.O. Boxes): 1500 Keene St.			
City: Galena Park	County: Harris	ZIP Code: 77547	
The public place has granted authorization to place the application for public viewing and copying.			☒ YES ☐ NO
The public place has internet access available for the public.			☒ YES ☐ NO
C. Concrete Batch Plants, PSD, and Nonattainment Permits			
1. County Judge Information (For Concrete Batch Plants and PSD and/or Nonattainment Permits) for this facility site.			
The Honorable: Edward M. Emmett			
Mailing Address: 1001 Preston, Suite 911			
City: Houston	State: TX	ZIP Code: 77002	
2. Is the facility located in a municipality or an extraterritorial jurisdiction of a municipality? *(For Concrete Batch Plants)*			☐ YES ☐ NO NA
Presiding Officers Name(s): NA			
Title: NA			
Mailing Address: NA			
City: NA	State: NA	ZIP Code: NA	
3. Provide the name, mailing address of the chief executives of the city and county, Federal Land Manager, or Indian Governing Body for the location where the facility is or will be located.			
Chief Executive: R.P. "Bobby" Barrett, Mayor of Galena Park			
Mailing Address: 2000 Clinton			
City: Galena Park	State: TX	ZIP Code: 77547	
Name of the Federal Land Manager: NA			
Title: NA			
Mailing Address: NA			
City: NA	State: NA	ZIP Code: NA	

Texas Commission on Environmental Quality
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V. Public Notice Information (complete if applicable) (continued)		
3. Provide the name, mailing address of the chief executives of the city and county, State, Federal Land Manager, or Indian Governing Body for the location where the facility is or will be located. *(continued)*		
Name of the Indian Governing Body: NA		
Title: NA		
Mailing Address: NA		
City: NA	State: NA	ZIP Code: NA
D. Bilingual Notice		
Is a bilingual program **required** by the Texas Education Code in the School District?	☒ YES ☐ NO	
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	☒ YES ☐ NO	
If *Yes*, list which languages are required by the bilingual program? Spanish		
VI. Small Business Classification (Required)		
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	☐ YES ☒ NO	
B. Is the site a major stationary source for federal air quality permitting?	☒ YES ☐ NO	
C. Are the site emissions of any regulated air pollutant greater than or equal to 50 tpy?	☒ YES ☐ NO	
D. Are the site emissions of all regulated air pollutants combined less than 75 tpy?	☐ YES ☒ NO	
VII. Technical Information		
A. The following information must be submitted with your Form PI-1 (this is just a checklist to make sure you have included everything)		
1. Current Area Map ☒ - See Section 3 of the application.		
2. Plot Plan ☒ - See Section 3 of the application.		
3. Existing Authorizations ☒ - See Section 1 of the application.		
4. Process Flow Diagram ☒ - See Section 4 of the application.		
5. Process Description ☒ - See Section 4 of the application.		
6. Maximum Emissions Data and Calculations ☒ - See Section 5, Appendix A, and Appendix B of the application.		
7. Air Permit Application Tables ☒ - See Appendix D of the application.		
a. Table 1(a) (Form 10153) entitled, Emission Point Summary ☒ - See Section 5 of the application.		
b. Table 2 (Form 10155) entitled, Material Balance ☒ - See Appendix D of the application.		
c. Other equipment, process or control device tables ☒ - Detailed equipment, process, and control device information is included in the emission calculations in Appendix A of the application.		

VII. Technical Information			
B. Are any schools located within 3,000 feet of this facility?			☐ YES ☒ NO
C. Maximum Operating Schedule:			
Hours: 24	Day(s): 7	Week(s): 52	Year(s): 20
Seasonal Operation? If Yes, please describe in the space provide below.			☐ YES ☒ NO
D. Have the planned MSS emissions been previously submitted as part of an emissions inventory?			☐ YES ☒ NO
Provide a list of each planned MSS facility or related activity and indicate which years the MSS activities have been included in the emissions inventories. Attach pages as needed.			
E. Does this application involve any air contaminants for which a *disaster review* is required?			☐ YES ☒ NO
F. Does this application include a pollutant of concern on the *Air Pollutant Watch List (APWL)*?			☒ YES ☐ NO

VIII. State Regulatory Requirements **Applicants must demonstrate compliance with all applicable state regulations to obtain a permit or amendment**. *The application must contain detailed attachments addressing applicability or non applicability; identify state regulations; show how requirements are met; and include compliance demonstrations.*	
A. Will the emissions from the proposed facility protect public health and welfare, and comply with all rules and regulations of the TCEQ?	☒ YES ☐ NO
B. Will emissions of significant air contaminants from the facility be measured?	☒ YES ☐ NO
C. Is the Best Available Control Technology (BACT) demonstration attached?	☒ YES ☐ NO
D. Will the proposed facilities achieve the performance represented in the permit application as demonstrated through recordkeeping, monitoring, stack testing, or other applicable methods?	☒ YES ☐ NO

IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** *The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.*	
A. Does Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?	☒ YES ☐ NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?	☒ YES ☐ NO
C. Does 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?	☒ YES ☐ NO

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment *The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.***	
D. Do nonattainment permitting requirements apply to this application?	☐ YES ☒ NO
E. Do prevention of significant deterioration permitting requirements apply to this application?	☒ YES ☐ NO
F. Do Hazardous Air Pollutant Major Source [FCAA 112(g)] requirements apply to this application?	☐ YES ☒ NO
G. Is a Plant-wide Applicability Limit permit being requested?	☐ YES ☒ NO
X. Professional Engineer (P.E.) Seal	
Is the estimated capital cost of the project greater than $2 million dollars?	☒ YES ☐ NO
If *Yes*, submit the application under the seal of a Texas licensed P.E.	
XI. Permit Fee Information	
Check, Money Order, Transaction Number ,ePay Voucher Number:	Fee Amount: NA
Company name on check: NA	Paid online?: ☐ YES ☐ NO
Is a copy of the check or money order attached to the original submittal of this application?	☐ YES ☐ NO ☒ N/A
Is a Table 30 (Form 10196) entitled, Estimated Capital Cost and Fee Verification, attached?	☐ YES ☐ NO ☒ N/A

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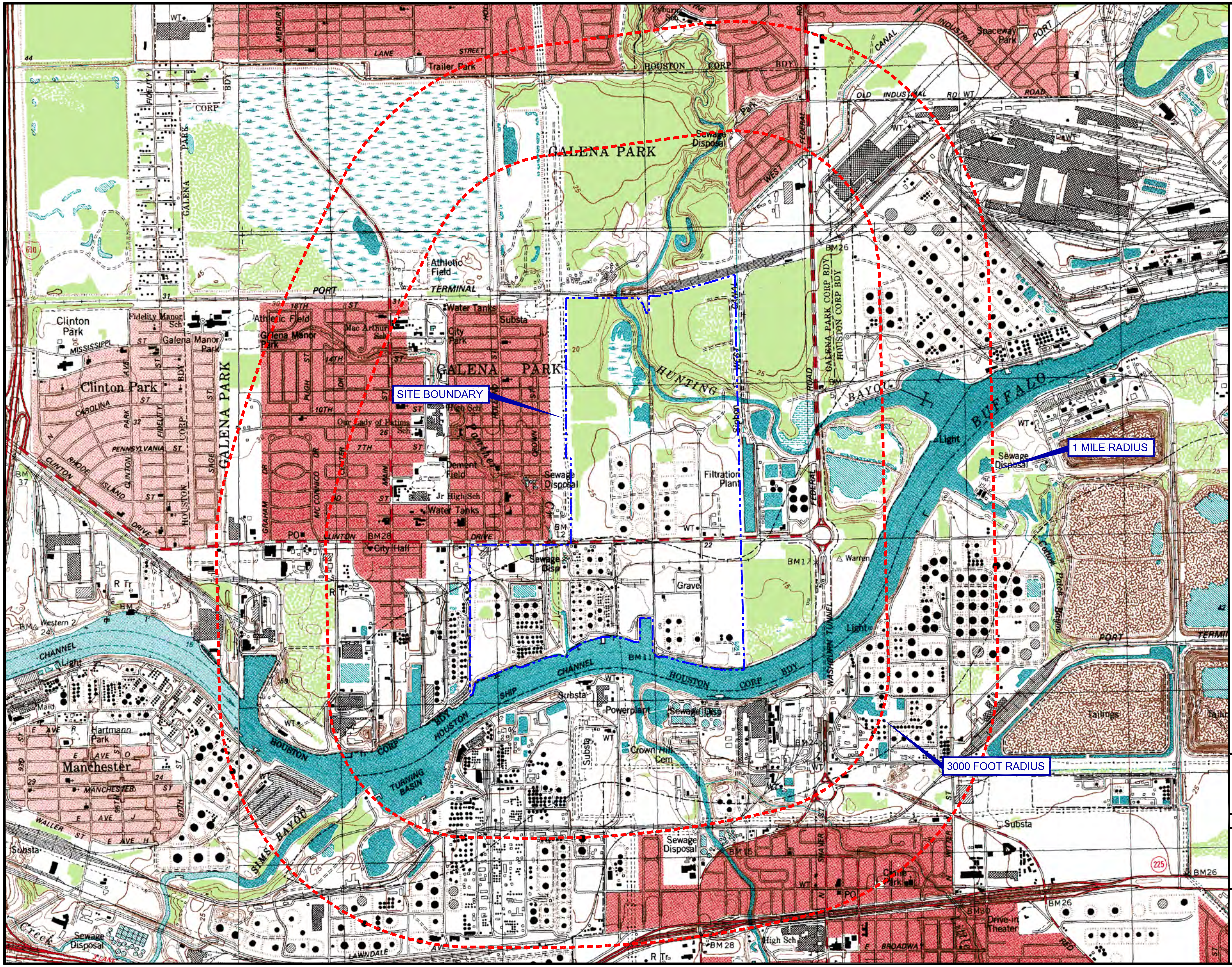
XII. Delinquent Fees and Penalties
This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at:
XIII. 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. 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, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations 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: W. P. Brown
Signature: W. P. Brown *Original Signature Required*
Date: 3/23/12

Section 3
Area Map and Plot Plan

An area map is provided in Figure 3-1 which details the 3,000-foot and one-mile distance markings. An overall plot plan of the Galena Park Terminal is provided in Figure 3-2. A detailed plot plan for the proposed condensate splitter and the associated facilities is provided in Figure 3-3.



Map Source: USGS 7.5 Min. Quad Sheets JACINTO CITY, TX., 1982; PARK PLACE, TX., 1982; PASADENA, TX., 1982; SETTEGAST, TX., 1982.

N

0 2000
SCALE IN FEET

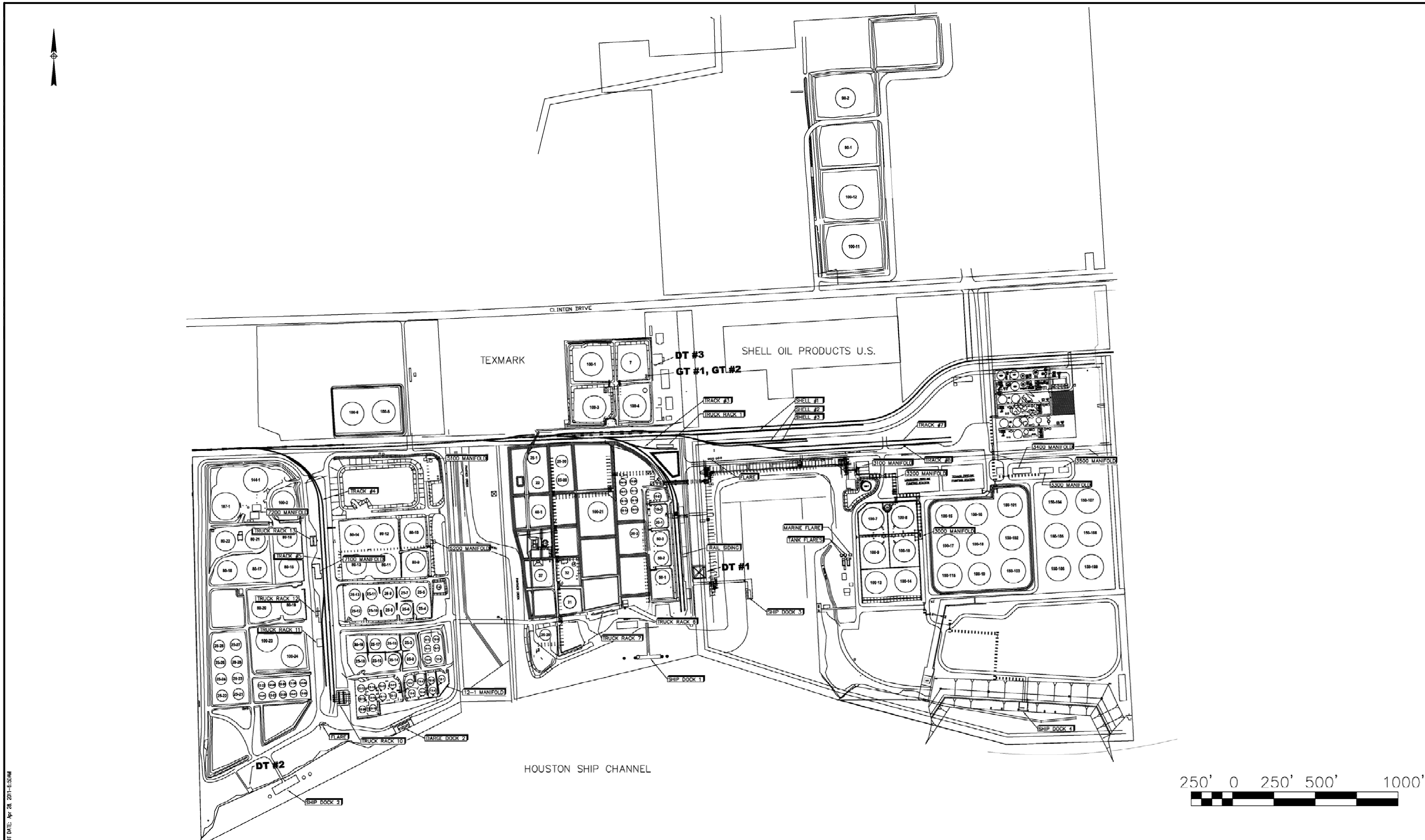
TEXAS
QUADRANGLE LOCATION

KINDER MORGAN
LIQUIDS TERMINALS, L.P.

PROJ. NO.: Kinder Morgan	DATE: 2/23/06	FILE: KinMor–B05

FIGURE 3-1
AREA MAP
GALENA PARK TERMINAL

RPS
14450 JFK Blvd., Suite 400
Houston, TX 77032



PLOT DATE: Apr 28, 2011-6:50AM

CONTRACTOR BLOCK

NOTES

DRAWING NUMBER	REFERENCE DRAWING

REV. No.	DESCRIPTION	DATE	DRAWN	CHK'D	APP'D
3	GENERAL UPDATES	6-13-08	JLM	JS	JS
2	RELOCATED TANKS 100-13 AND 100-14	4-27-06	SGM		
1	ADDED TANKS 100-13 AND 100-14	10-29-05	SGM		

KINDER MORGAN

DRAWN S. MARTIN
CHECKED
APPROVED
PROJ. ENGR.

APPROVED
REGIONAL ENGR.

Figure 3-2
Galena Park Terminal Plot Plan

RPS

14450 JFK Blvd. Suite 400
Houston, Tx 77032

CONTRACTOR BLOCK	NOTES

DRAWING NUMBER	REFERENCE DRAWING	REV. No.	DESCRIPTION	DATE	DRAWN	CHK'D	APP'D
		A	ISSUED FOR REVIEW	11-15-11	SGM		

KINDER MORGAN

DRAWN S. MARTIN
CHECKED
APPROVED PROJ. ENGR.

APPROVED REGIONAL ENGR.

Figure 3-3
Proposed Condensate Splitter Plot Plan

RPS
14450 JFK Blvd. Suite 400
Houston, Tx 77032

Section 4
Project and Process Description

The Galena Park Terminal is a for-hire bulk petroleum storage terminal. Petroleum products and specialty chemicals are stored in various storage tanks and transferred in and out of the terminal tankage for external customers via pipeline, tank truck, railcar, and marine vessel. The facility consists of various storage tanks and associated piping, loading, and control equipment. The proposed condensate splitter to be installed at the Galena Park Terminal, will consist of two trains which will each process 50,000 bbl/day of a hydrocarbon condensate material to obtain products suitable for commercial use. The process described in the following paragraphs utilizes conventional distillation technology.

The hydrocarbon condensate is fed from storage to the stabilizer column where a lighter condensate fraction is distilled from the overhead and a heavier fraction is withdrawn from the bottom of the column. The feed to this stabilizer column is preheated with waste heat recovered from hot product streams to reduce the amount of heat required for distillation. The majority of the heat required is supplied by a direct fired heater which utilizes primarily natural gas as the fuel and exchanges heat with a bottoms recirculating stream from the fractionation column. A bottoms recirculating pump is provided to establish the required flow. An appropriate amount of heat is also recovered from hot products going to storage by heat exchange with an internal column liquid to provide additional heat for distillation. This heat exchange also helps to reduce the amount of heat required from the direct fired heater. The overhead product from the stabilizer column is condensed and is stored in pressurized storage for transfer by truck to offsite facilities for further processing. Note that the overhead product may also be utilized as a fuel supply for the heaters for up to 1% of the total heat input. The bottoms stream from the stabilizer column is transferred to a second coil in the direct fired heater to add preheat before further fractionation in the main fractionation column.

This main fractionation column splits the bottoms from the stabilizer column into four commercially acceptable streams. Two of these streams are taken off as side draws and fed to the top of individual stripping columns. Lighter material is stripped from the product draw in each of these columns by introducing heat to the bottom of each individual column. This is accomplished by recirculating the column bottoms through individual coils in a second fired heater with centrifugal pumps. The stripping vapor is returned to the main fractionation column from the overhead of each column and the stripped bottoms product from each column is used to preheat the feed stock before final cooling and transfer to storage.

In addition to the side draw products, a bottoms product and overhead product are produced from the main fractionation column. These products represent the heaviest fraction and the lightest fraction of the stabilized condensate respectively. Heat is applied to the bottom of the column through a recirculation system that utilizes centrifugal pumps to transfer the total bottom stream to the second fired heater, which is also fueled with natural gas. A portion of the fluid that is re-circulated through this heater is vaporized for heat input to the column. The remaining portion is withdrawn as the heavy product from the column and is used to preheat the feed to the process before final cooling and transfer to storage. The overhead vapor from the main fractionation column is condensed using ambient air. A portion of the resulting liquid is returned to the column to cool the overhead vapor stream. The remaining portion is produced as a light condensate product that is used to heat the feed to the process before final cooling and transfer to storage.

In addition to the main fractionation units described above, there are certain support processes that are required. Among them is an elevated flare that is used in emergency overpressure situation to dispose of excess process vapor. Also note that existing docks will be utilized to transfer products offsite and a new tank truck rack for the Y-Grade product loading will be constructed for product transfer.

Simplified process flow diagrams for the facilities included in this application are included as Figures 4-1 and 4-2.

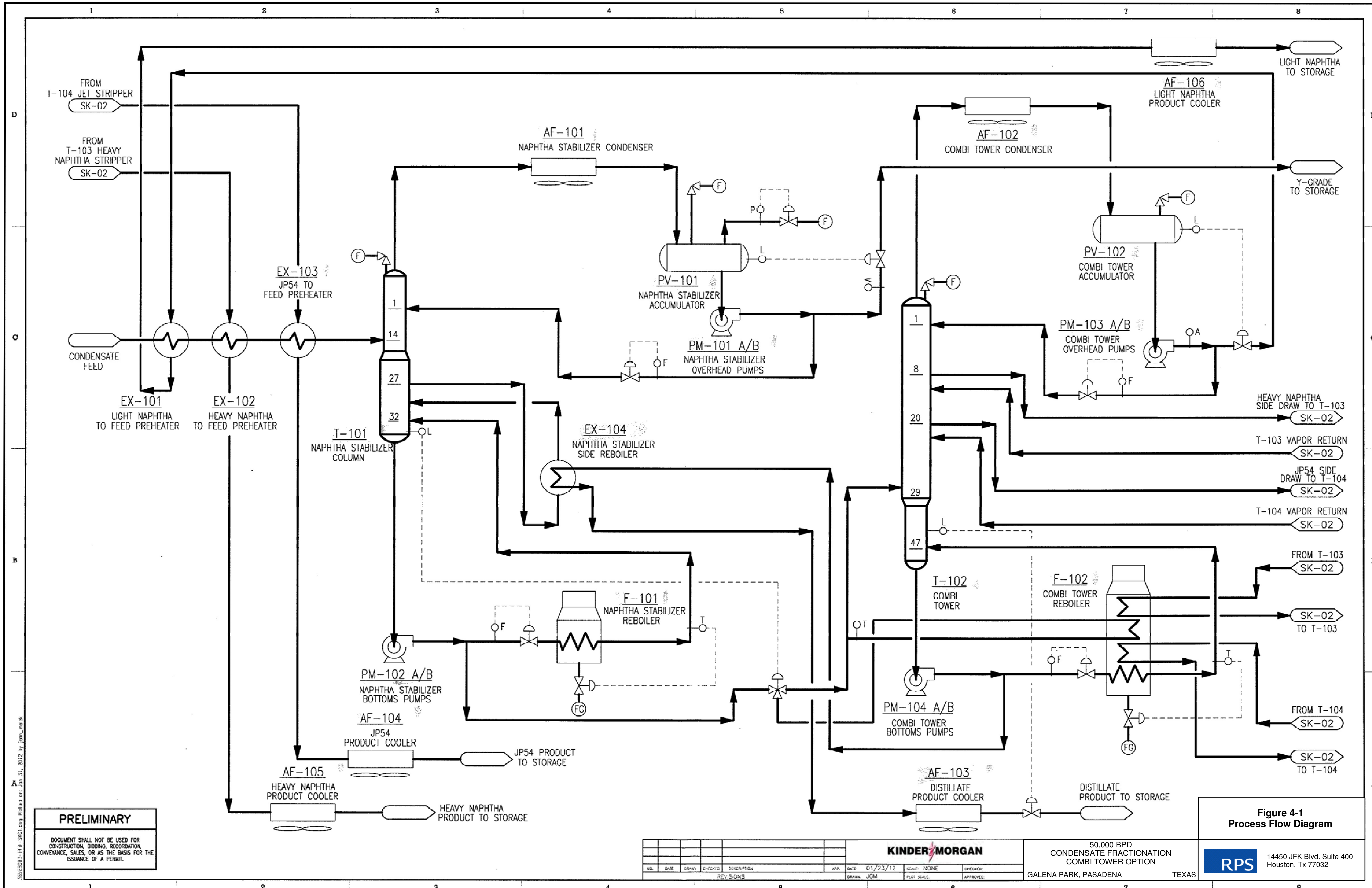


Figure 4-1
Process Flow Diagram

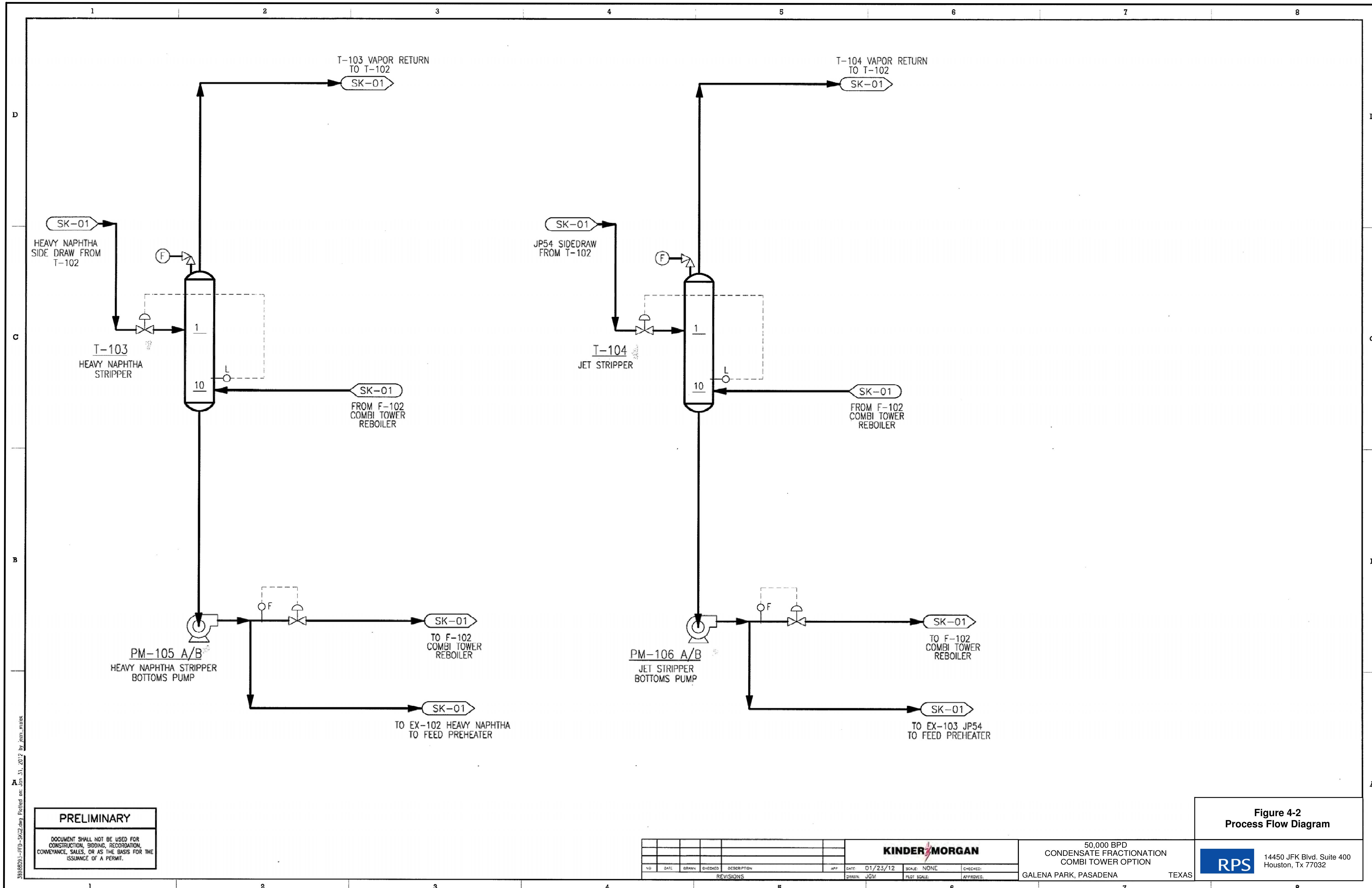


Figure 4-2
Process Flow Diagram

Section 5
GHG Emissions Summary

This section contains the completed TCEQ Table 1(a) showing the GHG emissions rates for the facilities included in this application. The GHGs emitted from the proposed facilities include carbon monoxide (CO_2), methane (CH_4), and nitrous oxide (N_20). KMLT does not anticipate emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), or sulfur hexafluoride (SF_6) from the proposed facilities. The carbon dioxide equivalent (CO_2e) emission rates are based on the estimated mass emission rates for each applicable GHG multiplied by the global warming potential (GWP) for each specific GHG per 40 CFR Part 98, Subpart A, Table A-1. Detailed individual GHG mass emission calculations as well as the corresponding CO_2e emission rates are presented in Appendix A and B of this application. Both routine and MSS emissions are addressed in this application and the emission calculations for both types are discussed below.

5.1 Routine GHG Emissions

Appendix A provides a summary of the routine GHG emissions included in this application from the following facility types:

- Heaters;
- Flare;
- Storage Tanks;
- Fugitives; and
- Marine Vessel and Tank Truck Loading.

5.1.1 Heaters

The new condensate splitter plant will utilize four natural gas fired heaters. Note no more than 1% of the total heat input to the heaters will consist of gas produced by the proposed condensate splitter plant. Heater GHG emission calculations are included in Appendix A as Table A-1. GHG emission estimates for routine operations assume an annual average firing rate to determine annual emissions. GHG emission factors for CO_2, CH_4, and N_20 were taken from 40 CFR Part 98, Subpart C, Tables C-1 and C-2.

Although the annual heater GHG cap is based on these emission factors, this low level is not necessarily expected to be achieved by individual combustion units on an annual basis because of typical variations in operating conditions. KMLT only represents that the sum of the GHG emissions from the combustion units will comply with the annual cap based on management of heater operating rates and good combustion practices.

5.1.2 Flare

The new condensate splitter plant will utilize a process flare which is designed for control of venting during MSS and upset situations. Flare pilot GHG emission calculations are included in Appendix A as Table A-2. GHG emissions associated with anticipated MSS activities controlled via the process flare are discussed in Section 5.2.2.

Natural gas used as pilot gas contains hydrocarbons, primarily CH_4, that also produce GHG emissions when burned. Any unburned CH_4 from the flare will also be emitted to the atmosphere along with small quantities of N_2O emission resulting from the combustion process. Emissions of these pollutants were calculated based on the equations and emission factors taken from 40 CFR Part 98. These equations and factors were applied to the maximum projected natural gas flow rates to the process flare.

5.1.3 Storage Tanks

The new condensate splitter plant includes ten internal floating roof (IRF) storage tanks, seven fixed roof (FXD) storage tanks, and seven pressurized (PRS) storage tanks. Based on the contents of the proposed tanks, GHG emissions have been determined to be negligible; therefore, GHG emission estimates for the proposed tanks are not included in this GHG PSD permit application.

5.1.4 Fugitives

The new condensate splitter plant will contain process piping components. Fugitive GHG emission calculations are included in Appendix A as Table A-3. Fugitive emission rates of VOC, including CH_4, from piping components and ancillary equipment were estimated using the methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives, October 2000.*

Each fugitive component was classified first by equipment type (i.e., valve, pump, relief valve, etc.) and then by material type (i.e., gas/vapor, light liquid, heavy liquid). An uncontrolled VOC emission rate was obtained by multiplying the number of fugitive components of a particular equipment/material type by an appropriate emission factor. Synthetic Organic Chemical Manufacturing Industry (SOCMI) factors (without ethylene) were used to estimate emissions from the proposed components as the streams have an ethylene content of <11%.

To obtain controlled fugitive emission rates, the uncontrolled rates were multiplied by a control factor, which was determined by the type of leak detection and repair (LDAR) program employed. KMLT will implement an enhanced 28LAER LDAR program for fugitive components associated with the proposed condensate splitter plant. The CH_4 emissions were then calculated by multiplying the total controlled emission rate by the weight percent of CH_4 in the process streams. To ensure the GHG emission calculations are conservative in the absence of detailed stream speciation information, the CH_4 concentration was assumed to be 100%. Although this is a highly conservative assumption, fugitive GHG emissions are negligible compared to the GHG emission rates from fuel combustion; therefore, this assumption has no significant impact on the total project GHG emissions.

5.1.5 Marine Vessel and Tank Truck Loading

The new condensate splitter plant will utilize a new tank truck and existing marine loading facilities to transfer condensate splitter plant product off-site. GHG emission calculations from these loading operations are included in Appendix A as Tables A-4 through A-5. VOC emissions resulting from loading activities were calculated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources: Loading Operations (October 2000)* using the following equation from AP-42 "Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources":

$$L = 12.46 * S * P * M/T$$

where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lbmole)
T = Temperature of bulk liquid loaded (R)

The VOC loading emission estimates were based on the physical property data of the material loaded and the actual loading method used. The controlled VOC emissions for products with a vapor pressure greater than 0.5 psia utilize a vapor collection system that is routed to a control device with a minimum destruction efficiency of 99%. GHG emissions associated with the combustion of VOC loading emissions were estimated using the methods described in Section 4.1.2. Specifically, GHG emissions were calculated based on the carbon content of the controlled VOC streams sent to the flare and of the natural gas used as pilot/assist gas waste with the equations and emission factors taken from 40 CFR Part 98. These equations and factors were applied to the maximum projected VOC and natural gas flow rates to the control device.

Liquids with vapor pressures above atmospheric pressure will be vapor balanced and loaded into pressurized tank trucks with no venting to the atmosphere. The loading of such liquids in pressurized tank trucks is possible because the material in the tank can evaporate or condense as liquid levels change to accommodate liquid level changes without venting.

5.2 Maintenance, Startup, and Shutdown Emissions

This application only addresses the GHG MSS emissions associated with the facilities included in this application. Table B-1 in Appendix B provides a summary of the GHG MSS emissions included in this application. GHG MSS emissions are estimated for the following source types:

- Heaters;
- MSS Vapor Control;
- Storage Tanks;
- Process Equipment and Piping;
- Air Mover and Vacuum Truck; and
- Frac Tanks.

5.2.1 Heaters

The new condensate splitter plant will utilize four natural gas fired heaters. The proposed heaters are expected to operate within the proposed routine GHG emission rates discussed in Section 5.1.1; therefore, additional GHG emissions associated with MSS activities for the proposed heaters are not included in this GHG PSD permit application.

5.2.2 MSS Vapor Control

The new condensate splitter will utilize the process flare described in Section 5.1.2 and portable vapor control equipment (i.e., vapor combustor units, engines, etc.) to control VOCs associated with MSS activities. Sections 5.2.3 through 5.2.6 provide emission calculations details for the VOC vapors being sent to combustion devices that result in GHG emissions. MSS combustion GHG emission calculations are included in Appendix B as Tables B-2 and B-7. These GHG MSS emissions are associated with entire process unit turnarounds, storage tanks, process equipment, piping, air movers, vacuum trucks, and frac tanks. The controlled MSS emissions described in Sections 5.2.3, 5.2.4, 5.2.5, and 5.2.6. will be collected via vapor recovery equipment and routed to either the process flare or portable control devices provided by contractors. GHG emission estimates for MSS activities assume an annual total heat input to determine annual emissions. GHG emission factors for CO_2, CH_4, and N_20 were taken from 40 CFR Part 98, Subpart C, Tables C-1 and C-2.

5.2.3 Storage Tanks

As previously discussed in Section 5.2.2, the new condensate splitter plant will utilize the proposed process flare and portable control equipment during storage tank MSS activities. These activities generate VOC emissions which require control and are included in Appendix B as Table B-3. Storage tank floating roof landing VOC emissions were estimated using the methods in Subsection 7.1.3.2.2 Roof Landings of Section 7.1 Organic Liquid Storage Tanks of *Compilation of Air Pollutant Emission Factors: Volume 1 Stationary Point and Area Sources* (AP-42, Fifth Edition, U.S. EPA, November 2006 (hereafter referred to in this application as AP-42).

Landing losses occur from floating roof tanks whenever the tank is drained to a level where its roof lands on its legs or other supports. When a floating roof lands on its supports or legs while the tank is being drained, the floating roof remains at the same height while the product level continues to lower. This creates a vapor space underneath the roof. Liquid remaining in the bottom of the tank provides a continuous source of vapors to replace those expelled by breathing (in the case of internal floating roof tanks) or wind action (in the case of external floating roof tanks). These emissions, referred to as *standing idle losses* (L_{SL}), occur daily as long as the floating roof remains landed.

Additional emissions occur when incoming stock liquid fills a tank with a landed roof. The incoming volume of liquid not only displaces an equivalent volume of vapors from below the floating roof, but also generates its own set of product vapors that are displaced during the filling process. These two types of emissions are collectively referred to as *filling losses* (L_{FL}).

For a given roof landing event, total landing loss emissions are therefore the sum of the filling losses and the daily standing idle losses over the entire period that the roof remained landed. Landing losses are inherently episodic in nature and must be determined each time a tank's floating roof is landed.

Tank design considerations will impact both standing idle and filling loss emissions. Therefore, AP-42 separates floating roof tanks into the following three categories for emissions determination purposes:

- Internal floating roof tanks (IFRTs) with a full or partial heel;
- External floating roof tanks (EFRTs) with a full or partial heel; and
- IFRTs and EFRTs that drain dry.

AP-42 presents standing idle and filling loss equations for each different tank category listed above.

For a given tank, standing idle and filling loss equations from AP-42 are used to determine the emissions for each roof landing event. The annual landing loss emissions can then be determined by summing the emissions from each episode that occurs within a given calendar year. Emissions from each roof landing episode can be individually determined using accurate temperature data and stored liquid properties for the time of year when the roof landing event occurred.

Common data to all emission calculations are the physical tank parameters, meteorological data, and the physical properties of the materials being stored. Meteorological data was taken from the EPS's TANKS Version 4.0 emissions estimate software database. The calculation methodology used for the standing loss and refilling emissions is discussed in further detail below.

Similar to breathing losses under normal operating conditions, standing idle losses occur during that period of time a roof is landed with product still in the tank. Emission calculation equations for these losses are from AP-42. The quantity of emissions is dependent upon the number of days idle, tank type (IFR/EFR), type of product stored, and time of year.

For IFR tanks with a liquid heel, standing losses [lbs] are calculated using Equation 2-16 from AP-42:

$$L_{SL} = n_d K_e (PV_v / RT) M_v K_s ,$$

where,

n_d= number of days standing idle,

K_e= vapor space expansion factor,

P= true vapor pressure of stock liquid [psia],

V_V = volume of vapor space below landed roof [ft^3],

= $\pi(D/2)^2 h_V = \pi(D/2)^2(h_{ld} - h_{le})$

h_V = height of the vapor space under the floating roof [feet],

h_{ld} = height of the landed roof [feet]

h_{le} = effective height of the stock liquid [feet],

R = ideal gas constant [10.731 psia ft^3 / lb-mole-°R],

T = average temperature of vapor and liquid below landed floating roof [°R],

M_V = stock vapor molecular weight [lb/lb-mole], and

K_s= standing idle saturation factor.

The standing losses cannot physically exceed the available stock liquid in the tank. Therefore, an upper limit to the standing losses [lbs] is provided in Equation 2-13 from AP-42:

$$L_{SL\max} \leq 5.9 D^2 h_{le} W_l \,,$$

where,

D = tank diameter [feet],

h_{le} = effective height of the stock liquid [feet], and

W_l = stock liquid density [lb/gal].

Maximum annual emissions were based on one landing per tank per year. It was assumed that the tank could stand idle for up to three days; therefore, standing idle emissions were estimated assuming a full liquid heel.

Similar to loading losses, refilling losses occur while a tank is being filled with product during that period of time a roof is landed. Emission calculation equations for these losses are from AP-42. The quantity of emissions is dependent upon the tank type (IFR/EFR), type of product stored, time of year, and fill rate.

The maximum refilling loss is based on: (1) the tank re-fill rate; and (2) the month resulting in the highest emissions as a function of vapor pressure.

The refilling emissions from IFR tanks with a liquid heel and tanks that are drained dry are based on the following calculation from Equation 2-26 from AP-42:

$$L_{FL} = \left(PV_v / RT\right) M_V S \,,$$

where,

P = true vapor pressure of stock liquid (at T_{LA}) [psia],

V_V = volume of vapor space [ft^3],

R = ideal gas constant [10.731 psia ft^3 / lb-mole-°R],

T = average temperature of vapor and liquid below landed floating roof [°R],

= daily average liquid surface temperature, T_{LA},

M_V = stock vapor molecular weight [lb/lb-mole], and

S = filling saturation factor (0.6 for full heel, 0.5 for partial heel, and 0.15 for drain-dry)

Maximum annual emissions were based on one landing per tank per year.

The roof landing emissions will be collected via vapor recovery equipment and routed to a portable thermal control device. Emissions from the control device were estimated using the methods outlined Section 5.2.2.

When the storage tanks (i.e., IFR, FXD, and PRS) included in this application store liquids with a vapor pressure greater than 0.5 psia and degassing is required, KMLT proposes to control the resulting vapors in a manner consistent with good engineering practice and in accordance with the VOC degassing regulations specified in 30 TAC §115.541-549. GHG emissions resulting from storage tank degassing via combustion device are discussed in detail in Section 5.2.2.

5.2.4 Process Equipment and Piping

As previously discussed in Section 5.2.2, the new condensate splitter plant will utilize the proposed process flare and portable control equipment during process equipment and piping MSS activities. These activities generate VOC emissions which require control and are included in Appendix B as Table B-4. On occasion, process equipment (i.e., vessels, towers, etc.) and/or piping (i.e., pumps, valves, meters, etc.) are degassed in preparation for an MSS and/or inspection activity. There are two components to the GHG emissions associated with process equipment and/or piping MSS activities; controlled depressurizing and degassing and controlled refilling activities.

The first component of the GHG emissions estimate is from the depressurizing and degassing of equipment and/or piping. Emissions from the depressurizing and degassing of equipment and piping were estimated using the Ideal Gas Law. GHG emissions resulting from depressurizing and degassing of equipment and/or piping via combustion device are described in detail in Section 5.2.2.

The second component of the GHG emissions estimate is from pumping material into equipment and/or piping following the completion of an MSS and/or inspection activity. The emissions from the equipment loading activities are vented to the control devices described in Section 5.2.2. These emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

$$L = 12.46 * S * P * M / T$$

Where:

L = Loading Loss ($lb/10^3$ gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

5.2.5 Air Mover and Vacuum Truck Activities

As previously discussed in Section 5.2.2, the new condensate splitter plant will utilize the proposed process flare and portable control equipment during MSS activities which require the use of air mover and vacuum trucks. These activities generate VOC emissions which require control and are included in Appendix B as Table B-5. VOC vapors are displaced as a result of an air mover and/or vacuum truck activity to collect and remove materials from tanks, process equipment, piping, frac tanks, and portable tank/containers. Air mover and vacuum truck emissions are calculated based on the loading method and control device in use. KMLT proposes to utilize air movers and vacuum trucks which apply a vacuum during loading operations. These emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

$$L = 12.46 * S * P * M / T$$

Where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

Annual emissions were determined based on the projected loading throughput. Loading emissions are routed to a control device which may include, but is not limited to, thermal control, carbon control, etc. GHG emissions resulting from air mover and vacuum truck activities via combustion device are described in detail in Section 5.2.2.

5.2.6 Frac Tanks

As previously discussed in Section 5.2.2, the new condensate splitter plant will utilize the proposed process flare and portable control equipment during MSS activities which require the use of frac tanks. These activities generate VOC emissions which require control and are included in Appendix B as Table B-6. Residual material is drained and/or pumped from tanks, process equipment, piping, portable tanks, portable containers, etc. into frac tanks as part of facility MSS and/or inspection activities. The frac tank working emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

$$L = 12.46 * S * P * M / T$$

Where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

The frac tank breathing emissions were estimated using EPA's *TANKS 4.0* Computer Program, which is based on the emission calculation methods in AP-42 Section 7. GHG emissions resulting from frac tanks activities via combustion device are described in detail in Section 5.2.2.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Table 1(a) Emission Point Summary

Permit Number:	TBD	RN Number:	RN100237452	Date:	3/22/2012
Company Name:	KM Liquids Terminals LLC				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^{o}F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
F-101	F-101	Naphtha Splitter Reboiler Train I	CO_2	NA[1]	-	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	-										
			N_2O	NA[1]	-										
			$CO2_e$	NA[1]	-										
F-102	F-102	Combi Tower Reboiler Train I	CO_2	NA[1]	-	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	-										
			N_2O	NA[1]	-										
			$CO2_e$	NA[1]	-										
F-201	F-201	Naphtha Splitter Reboiler Train II	CO_2	NA[1]	-	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	-										
			N_2O	NA[1]	-										
			$CO2_e$	NA[1]	-										

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	Above Ground (Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
F-202	F-202	Combi Tower Reboiler Train II	CO_2	NA[1]	-	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	-										
			N_2O	NA[1]	-										
			$CO2_e$	NA[1]	-										
HEAT-CAP	HEAT-CAP	Heater Annual Emissions Cap	CO_2	NA[1]	190,865	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	4										
			N_2O	NA[1]	< 1										
			$CO2_e$	NA[1]	191,052										
FL-101	FL-101	Flare No. 101	CO_2	NA[1]	78	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	< 1										
			N_2O	NA[1]	< 1										
			$CO2_e$	NA[1]	78										

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height	6. Stack Exit Data			7. Fugitives		
									Above	Diameter	Velocity	Temp	Length	Width	Axis
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	Ground (Feet)	(Feet) (A)	(fps) (B)	(^oF) (C)	(ft) (A)	(ft) (B)	Degrees (C)
FUG	FUG	Process Fugitive Components	CH_4	NA[1]	8										
			$CO2_e$	NA[1]	163	-	-	-	-	-	-	-	-	-	-
MAR-VCU	MAR-VCU	Marine Loading VCU Emissions Cap	CO_2	NA[1]	3,042	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	< 1	-	-	-	-	-	-	-	-	-	-
			N_2O	NA[1]	< 1	-	-	-	-	-	-	-	-	-	-
			$CO2_e$	NA[1]	3,052	-	-	-	-	-	-	-	-	-	-
MSS	MSS	MSS Emissions	CO_2	NA[1]	7,282	-	-	-	-	-	-	-	-	-	-
			CH_4	NA[1]	< 1										
			N_2O	NA[1]	< 1										
			$CO2_e$	NA[1]	7,282										

Notes:

1. Short-term (lb/hr) limits are not applicable to GHG emissions.

Section 6
Best Available Control Technology Analysis

PSD regulations require that the best available control technology (BACT) be applied to each new and modified facility that emits an air pollutant for which a significant net emissions increase will occur from the source. The only PSD pollutant addressed in this permit application is GHG. The proposed condensate splitter plant will consist of two trains which will each process 50,000 bbls/day of a hydrocarbon condensate material to obtain products suitable for commercial use. In general, the products (Y-Grade, Light Naphtha, Heavy Naphtha, and Kerosene/Diesel) will be produced by a distillation process. The majority of the GHG emissions associated with the proposed project are the result of the energy required for this distillation process. Specifically, 191,052 tpy CO_2e of the proposed project emissions increase of 201,945 tpy $C0_2e$ (94.6%) are generated from the four heaters associated with the distillation. This BACT analysis will focus primarily on the CO_2 emissions from the proposed heaters. KMLT searched the EPA RACT/BACT/LAER Clearinghouse (RBLC) database only for applicable CO_2 BACT determinations to assist in identifying potential GHG control technologies relevant to the proposed heater emissions. Appendix C of this application includes the corresponding heater RBLC search results.

The U.S. EPA-preferred methodology for a BACT analysis for pollutants and facilities subject to PSD review is described in a 1987 EPA memo (U.S. EPA, Office of Air and Radiation Memorandum from J.C. Potter to the Regional Administrators, December 1, 1987). This methodology is to determine, for the emission source in question, the most stringent control available for a similar or identical source or source category. If it can be shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections. In addition, a control technology must be analyzed only if the applicant opposes that level of control.

In an October 1990 draft guidance document (*New Source Review Workshop Manual (Draft*), October 1990), EPA set out a 5-step process for conducting the referenced top-down BACT review, as follows:

1) Identification of available control technologies;

2) Technically infeasible alternatives are eliminated from consideration;

3) Remaining control technologies are ranked by control effectiveness;

4) Evaluation of control technologies for cost-effectiveness, energy impacts, and environmental effects in order of most effective control option to least effective; and

5) Selection of BACT.

In its *PSD and Title V Permitting Guidance for Greenhouse Gases* (November 2010), EPA reiterates that this is also the recommended process for permitting of GHG emissions under the PSD program. As such, this BACT analysis follows the top-down approach.

6.1 Heaters (EPNs: F-101, F-102, F-201, and F-202)

GHG emissions, primarily CO_2, are generated from the combustion of natural gas in the proposed heaters.

6.1.1 Step 1 – Identification of Potential Control Technologies

The applicable technologies for controlling GHG emissions from the proposed heaters include the following:

- Carbon Capture and Sequestration: In EPA's recent GHG BACT guidance, EPA takes the position that, *"for the purpose of a BACT analysis for GHGs, EPA classifies CCS as an add-on pollution control technology that is "available" for large CO_2e emitting facilities including fossil fuel-fired power plants and industrial facilities with high purity CO_2 streams*".
- Periodic Burner Tune-up: The burners are tuned periodically to maintain optimal thermal efficiency.
- Product Heat Recovery: Hot product streams are cooled with exchange of heat with the colder feed and the distillation column's stripping section to provide process heat in lieu of heat from the furnace.
- Distillation Column Efficiency: The distillation of multiple products is combined in a single distillation column with side-stream stripper columns to reduce the quantity of reflux required and, thereby, reduce the distillation heat required.
- Furnace Efficiency: Hot bottoms from the main distillation column are re-circulated through the stripper columns as a heating media for the column reboilers. It is then circulated through the furnace convection section to recover waste heat from furnace stack effluent.
- Furnace Efficiency: Hot oil is used in a separate furnace to supply heat at a lower temperature to the process to reduce furnace stack gas temperature and, thereby, increase furnace efficiency.
- Good Combustion Practices: Good fuel/air mixing in combustion zone as this design will employ the use of oxygen monitors and intake air flow monitors to optimize the fuel/air mixture and limit excess air; Limiting the excess air enhances efficiency and reduces emissions through reduction of the volume of air that needs to be heated in the combustion process; Proper fuel gas supply system design and operation to

minimize fluctuations in fuel gas quality; Sufficient residence time to complete combustion; Good burner maintenance and operation.

- Design Efficiency: Variable speed electric motors are being utilized on air coolers to reduce electrical running load.
- Design Efficiency: Larger electric drivers for centrifugal pumps are reduced in size by providing multiple parallel pump units that can be shut down when product rates are reduced.
- Fuel Selection: Natural gas has the lowest carbon intensity of any available fuel for the proposed heaters.

6.1.2 Step 2 – Elimination of Technically Infeasible Alternatives

Carbon capture and sequestration (CCS) is not a viable alternative for controlling GHG emissions from natural gas fired facilities. This conclusion is supported by the BACT example for a natural gas fired boiler in Appendix F of EPA's *PSD and Title V Permitting Guidance for Greenhouse Gases* (November 2010). In the EPA example, CCS is not even identified as an available control option for natural gas fired facilities.

KMLT is aware of one project for which a PSD permitting authority has proposed in a draft permit that CCS constitutes BACT for control of GHG emissions. That project, for which a permit application remains pending with the Indiana Department of Environmental Control at the time this KMLT application is submitted, is the Indiana Gasification project to capture CO_2 for use in enhanced oil recovery. The Indiana Gasification project differs from KMLT's project in several significant ways.

First, the Indiana Gasification project will gasify coal, producing significantly greater amounts of CO_2 than the KMLT project, with the primary product from the Indiana Gasification project being methane (also known as substitute natural gas (SNG)).

Secondly, the purity of the CO_2 stream resulting from the two processes differs greatly. When coal is gasified, the product is a mixture consisting primarily of CO, CO_2, and H_2. Then, in the SNG process, a series of reactions converts the CO and H_2 to methane. To meet pipeline specifications, the CO_2 must be removed from the SNG, which produces a relatively pure CO_2 stream that is naturally ready for sequestration. In contrast, combustion of natural gas and other carbon-based gaseous fuels, which is the design of the KMLT project, produces an exhaust stream that is roughly 10% CO_2, which is far from pure. Thus, while the Indiana Gasification project will naturally produce a CO_2 byproduct that is amenable to sequestration or use in enhanced oil recovery without further processing, the KMLT process does not. Separation (purification) of the CO_2 from the KMLT combustion exhaust streams would require additional costly steps not otherwise necessary to the process.

Additionally, the viability of the Indiana Gasification project is highly dependent on a 30 year contract requiring the State of Indiana to purchase the SNG produced and federal loan guarantees should the plant fail. In contrast, the KMLT project relies on market conditions for viability and is not guaranteed by the government.

The CO_2 streams included in this permit application are similar in nature (i.e., dilute streams) to the gas-fired industrial boiler in the EPA Guidance Appendix F example. Thus, they are not among the facility types for which the EPA guidance indicates CCS should be listed in Step 1. The inference from EPS's guidance document is that for facilities with dilute streams, CCS does not need to be listed as an available option in Step 1. However, for completeness purposes, KMLT has assumed that CCS is a potentially viable control option and has performed an order of magnitude cost analysis for CCS applied to the combustion facilities addressed in this application. The analysis, summarized in Table 6-1, shows that the cost of CCS for the project would be approximately $104 per ton of CO_2 controlled, which is not considered to be cost effective for GHG control. This equates to a total cost of $17,813,863 per year for the proposed heaters. This cost far exceeds the threshold that would make the project economically unviable; therefore, CCS is rejected as a control option on the basis of technical feasibility and excessive cost and is not considered further in the remainder of this analysis.

All of the remaining options identified in Section 6.1.1 are considered technically feasible.

6.1.3 Step 3 – Ranking of Remaining Technologies Based on Effectiveness

Since KMLT proposes to implement all of the remaining control options identified in Section 6.1.1, ranking the control options is not necessary.

6.1.4 Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

No adverse energy, environmental, or economic impacts are associated with the remaining control options identified in Section 6.1.1.

6.1.5 Step 5 – Selection of BACT

KMLT proposes to incorporate the remaining control options identified in Section 6.1.1 as BACT for controlling GHG emissions from the proposed condensate splitter plant heaters.

6.2 Flare (EPN: FL-101)

GHG emissions, primarily CO_2, are generated from the combustion of natural gas used to maintain the flare pilots.

6.2.1 Step 1 – Identification of Potential Control Technologies

The only viable control option for reducing GHG emissions from flaring is minimizing the quantity of flared waste gas and natural gas to the extent possible. The technically viable options for achieving this include:

- Flaring minimization – minimize the duration and quantity of flaring to the extent possible through good engineering design of the process and good operating practice.
- Proper operation of the flare – use of flow and composition monitors to accurately determine the optimum amount of natural gas required to maintain adequate VOC destruction in order to minimize natural gas combustion and resulting CO_2 emissions.

6.2.2 Step 2 – Elimination of Technically Infeasible Alternatives

Both of the options identified in Section 6.2.1 are considered technically feasible.

6.2.3 Step 3 – Ranking of Remaining Technologies Based on Effectiveness

Since KMLT proposes to implement both of the control options identified in Section 6.2.1, ranking the control options is not necessary.

6.2.4 Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

No adverse energy, environmental, or economic impacts are associated with control options identified in Section 6.2.1.

6.2.5 Step 5 – Selection of BACT

KMLT proposes use of both identified control options to minimize GHG emissions from flaring of process vents from the proposed facilities. Specifically, flaring minimization will be achieved in that waste gases from the proposed condensate splitter plant will be recycled back to the heaters as heat input (i.e., up to 1%) thus reducing the amount of nature gas heat input. The efficient use of natural gas as pilot gas will avoid the generation of unnecessary GHG and non-GHG emissions. The proposed process condensate splitter plant will be designed to minimize the volume of the waste gas sent to the flare.

6.3 Storage Tanks

The new condensate splitter plant includes ten internal floating roof (IRF), seven fixed roof (FXD), and seven pressurized (PRS) storage tanks. Based on the contents of the proposed tanks, working and breathing GHG emissions have been determined to be negligible; therefore, a GHG BACT analysis for the proposed tanks are not included in this GHG PSD permit application.

6.4 Process Fugitives (EPN: FUG)

Hydrocarbon emissions from leaking piping components (process fugitives) associated with the proposed project include methane, a GHG. The additional methane emissions from processes fugitives have been conservatively estimated to be 162.92 tpy as CO_2e. This is a negligible contribution to the total GHG emissions; however, for completeness, they are addressed in this BACT analysis.

6.4.1 Step 1 – Identification of Potential Control Technologies

The only identified control technology for process fugitive emissions of CO_2e is use of a leak detection and repair (LDAR) program. LDAR programs vary in stringency as needed for control of VOC emissions; however, due to the negligible amount of GHG emissions from fugitives, LDAR programs would not be considered for control of GHG emissions alone. As such, evaluating the relative effectiveness of different LDAR programs is not warranted.

6.4.2 Step 2 – Elimination of Technically Infeasible Alternatives

LDAR programs are a technically feasible option for controlling process fugitive GHG emissions.

6.4.3 Step 3 – Ranking of Remaining Technologies Based on Effectiveness

As stated in Step 1, this evaluation does not compare the effectiveness of different levels of LDAR programs.

6.4.4 Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

Although technically feasible, use of an LDAR program to control the negligible amount of GHG emissions that occur as process fugitives is clearly cost prohibitive. However, implementation of an LDAR program for VOC control purposes will also result in effective control of the small amount of GHG emissions from the same piping components. Pursuant to the representations in the NSR permit application that KMLT has submitted to the TCEQ for this project, KMLT will implement TCEQ's 28LAER LDAR program to minimize process fugitive VOC emissions at the proposed condensate splitter plant, and this program has also been proposed for the additional fugitive VOC emissions associated with the project. 28LAER is TCEQ's most stringent LDAR program, developed to satisfy Lowest Available Emission Rate (LAER) control requirements in ozone non-attainment areas.

6.4.5 Step 5 – Selection of BACT

Due to the negligible amount of GHG emissions from process fugitives, the only available control, implementation of an LDAR program, is clearly not cost effective, and BACT is determined to be no control. However, KMLT will implement TCEQ's 28LAER LDAR program for VOC BACT purposes, which will also effectively minimize GHG emissions. Therefore, the proposed VOC LDAR program more than satisfies GHG BACT requirements.

6.5 Marine Vessel and Tank Truck Loading (EPN: MAR-VCU)

GHG emissions, primarily CO_2, are generated from the combustion of VOC vapors associated with the loading of products from the proposed condensate splitter plant and assist natural gas used to maintain the required minimum combustion chamber temperature to achieve adequate destruction.

6.5.1 Step 1 – Identification of Potential Control Technologies

The only viable control option for reducing GHG emissions associated with loading vapor control is minimizing the quantity of combusted VOC vapors and natural gas to the extent possible. The technically viable options for achieving this include:

- Minimization – minimize the duration and quantity of combustion to the extent possible through good engineering design of the process and good operating practice.
- Proper operation of the vapor combustion unit (VCU) – use of flow and composition monitors to accurately determine the optimum amount of natural gas required to maintain adequate VOC destruction in order to minimize natural gas combustion and resulting CO_2 emissions.

6.5.2 Step 2 – Elimination of Technically Infeasible Alternatives

Both of the options identified in Section 6.5.1 are considered technically feasible.

6.5.3 Step 3 – Ranking of Remaining Technologies Based on Effectiveness

Since KMLT proposes to implement both of the control options identified in Section 6.5.1, ranking the control options is not necessary.

6.5.4 Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

No adverse energy, environmental, or economic impacts are associated with control options identified in Section 6.5.1.

6.5.5 Step 5 – Selection of BACT

KMLT proposes use of both identified control options to minimize GHG emissions associated with loading emissions control. Analyzers will be used to continuously monitor the combustion chamber temperature to determine the quantity of natural gas required to maintain a minimum combustion chamber temperature above 1,200°F and also to limit the quantity of natural gas used to only what is needed to maintain temperature. The efficient use of natural gas will avoid the generation of unnecessary GHG and non-GHG emissions.

6.6 Maintenance, Startup, and Shutdown Activities (EPN: MSS)

GHG emissions, primarily CO_2, are generated from the combustion of VOC vapors associated with MSS activities for the proposed condensate splitter plant and assist natural gas used to maintain the required minimum heating value or combustion chamber temperature to achieve adequate destruction.

6.6.1 Step 1 – Identification of Potential Control Technologies

The only viable control option for reducing GHG emissions associated with MSS vapor control is minimizing the quantity of combusted VOC vapors and natural gas to the extent possible. The technically viable options for achieving this include:

- Minimization – minimize the duration and quantity of combustion to the extent possible through good engineering design of the process and good operating practice.
- Proper operation of the flare/VCU – use of flow and composition monitors to accurately determine the optimum amount of natural gas required to maintain adequate VOC destruction in order to minimize natural gas combustion and resulting CO_2 emissions.

6.6.2 Step 2 – Elimination of Technically Infeasible Alternatives

Both of the options identified in Section 6.6.1 are considered technically feasible.

6.6.3 Step 3 – Ranking of Remaining Technologies Based on Effectiveness

Since KMLT proposes to implement both of the control options identified in Section 6.6.1, ranking the control options is not necessary.

6.6.4 Step 4 – Evaluation of Control Technologies in Order of Most Effective to Least Effective

No adverse energy, environmental, or economic impacts are associated with control options identified in Section 6.6.1.

6.6.5 Step 5 – Selection of BACT

KMLT proposes use of both identified control options to minimize GHG emissions associated with MSS emissions control. Flare system analyzers will be used to continuously monitor the combined waste gas stream sent to the flare from the proposed condensate splitter plant to determine the quantity of natural gas required to maintain a minimum heating value of 300 Btu/scf and also to limit the quantity of natural gas used to only what is needed to maintain 300 Btu/scf. Analyzers will also be used to continuously monitor the combustion chamber temperature to determine the quantity of natural gas required to maintain a minimum combustion chamber temperature above 1,200^{o}F and also to limit the quantity of natural gas use only what is needed to maintain temperature. The efficient use of natural gas will avoid the generation of unnecessary GHG and non-GHG emissions.

Table 6-1
Approximate Cost for Construction and Operation of a Post-Combustion CCS System

CCS System Component	Cost (\$/ton of CO_2 Controlled)[1]	Tons of CO_2 Controlled per Year[2]	Total Annual Cost
CO_2 Capture and Compression Facilities	\$103	171,947	\$17,710,523
CO_2 Transport Facilities (per 100 km of pipeline)[3]	\$0.91	171,947	\$15,647
CO_2 Storage Facilities	\$0.51	171,947	\$87,693
Total CCS System Cost	\$104	NA	\$17,813,863

Notes:

1. Costs are from *Report of the Interagency Task Force on Carbon Capture (August, 2010)* . A range of costs was provided for transport and storage facilities; for conservatism, the low ends of these ranges were used in this analysis as they contribute little to the total cost. Reported costs in \$/tonne were converted to \$/ton.

2. Tons of CO_2 controlled assumes 90% capture of all CO_2 emissions from the four heaters.

3. Pipeline costs are per 100 km of pipeline. It is conservatively assumed that a suitable storage location can be found within 10 km, which reduces the total cost for this component of the CCS system to a negligible amount.

Section 7
GHG PSD Applicability

Prevention of Significant Deterioration (PSD) permitting is required for a modification of an existing major source for each attainment pollutant and other regulated pollutants (such as H_2S and H_2SO_4) for which the modification will result in a significant net emissions increase. The GHG emission increases associated with this permit application are summarized and compared to the PSD applicability thresholds in Table 1-1 at the end of Section 1. Included at the end of this section are the applicable Table 1F and Table 2F. Harris County is designated attainment/unclassified for GHG PSD permitting purposes.

The Galena Park Terminal is currently considered a major source with respect to GHG emissions and subject to PSD permitting requirements because the project CO_2e emissions for the proposed condensate splitter plant will be greater than the 100,000 tpy significance level established by the EPA in its PSD Tailoring Rule of June 3, 2010. There are no significant decreases of GHG emissions in the contemporaneous period that could potentially result in the proposed project netting out of GHG PSD review; therefore, detailed GHG contemporaneous netting is not included as part of this application. Therefore, the proposed condensate splitter plant triggers PSD review for GHG emissions.

As a result of a final action published in May 2011, EPA promulgated a Federal Implementation Plan (FIP) to implement the GHG permitting requirements in Texas and EPA assumed the role as the GHG permitting authority for Texas GHG permits. Therefore, GHG emissions associated with the proposed condensate splitter plant are subject to the jurisdiction of the EPA.

TCEQ

TABLE 1F
AIR QUALITY APPLICATION SUPPLEMENT

Permit No.: TBD	Application Submittal Date: March 22, 2012
Company: KM Liquids Terminals LLC	
RN: 100237452	Facility Location: 906 Clinton Drive
City: Galena Park	County: Galveston
Permit Unit I.D.:	Permit Name:
Permit Activity: New Source ___ Modification _X__	
Project or Process Description: GHG Permit for Condensate Splitter Facility	

Complete for all Pollutants with a Project Emission Increase.	POLLUTANTS	
	GHG	
Nonattainment? (yes or no)	Yes	
Existing site PTE (tpy)?	> 100,000	
Proposed project emission increases (tpy from 2F)[2]	> 75,000	
Is the existing site a major source? [3]If not, is the project a major source by itself?	Yes NA	
Significance Level (tpy)	75,000	
If site is major, is project increase significant?	Yes	
If netting required, estimated start of construction?	1-Jan-13	
Five years prior to start of construction	1-Jan-08	contemporaneous
Estimated start of operation	1-Jan-14	period
Net contemporaneous change, including proposed project, from Table 3F. (tpy)	> 75,000	
FNSR APPLICABLE? (yes or no)	Yes	

1 Other PSD pollutants.

2 Sum of proposed emissions minus baseline emissions, increases only. Nonattainment thresholds are found in Table 1 in 30 TAC 116.12(11) and PSD thresholds in 40 CFR § 51.166(b)(23).

3 Nonattainment major source is defined in Table 1 in 30 TAC 116.12(11) by pollutant and county. PSD thresholds are found in 40 CFR § 51.166(b)(1).

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

W. P. Brown	V.P. Gulf Operations	3/23/12
Signature	Title	Date

Table 2F - CO_{2e}
Project Emission Increase

Pollutant[1]: CO2e	Permit No.: TBD
Baseline Period: NA	

	Affected or Modified Facilities FIN	EPN	Permit No.	Actual Emissions (tons/yr)	A Baseline Emissions (tons/yr)	B Proposed Emissions (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A) (tons/yr)	Correction (tons/yr)	Project Increase (tons/yr)
1	F-101	F-101	-	-	-	52,782	-	52,782	-	52,782
2	F-102	F-102	-	-	-	42,744	-	42,744	-	42,744
3	F-201	F-201	-	-	-	52,782	-	52,782	-	52,782
4	F-202	F-202	-	-	-	42,744	-	42,744	-	42,744
5	FL-101	FL-101	-	-	-	78	-	78	-	78
6	FUG	FUG	-	-	-	163	-	163	-	163
7	MAR-VCU	MAR-VCU	-	-	-	3,052	-	3,052	-	3,052
8	MSS	MSS	-	-	-	7,599	1	7,599	1	7,598
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
24										
									Page Subtotal9:	***201,944***

Notes:

1. Storage tank working and breathing emissions are part of a downstream process so all methane and CO2 emissions are expected to be negligible.

Appendix A

Routine Emission Calculation Details

Table A-1
Heater GHG Emission Calculations
KM Liquids Terminals LLC
Galena Park Terminal

Natural Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2	N_2O
kg/MMBtu	53.02	1.00E-04
Global Warming Potential (GWP)	1	310
lb/MMBtu	116.89	2.20E-04

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Firing Rates (MMBtu/hr) Annual Average	Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
Naphtha Splitter Reboiler - Train I	F-101	103	52,730.50	0.99	0.10	52,782.21
Combi Tower Reboiler - Train I	F-102	83	42,701.92	0.81	0.08	42,743.80
Naphtha Splitter Reboiler - Train II	F-201	103	52,730.50	0.99	0.10	52,782.21
Combi Tower Reboiler - Train II	F-202	83	42,701.92	0.81	0.08	42,743.80
Emission Totals			***190,864.84***	***3.60***	***0.36***	***191,052.03***

Notes:
1. Annual emission rate (tpy) = annual average heat input (MMBtu/hr) x emission factor (lb/MMBtu) x 8,760 hours of operation (hr/yr) x (1 ton / 2,000 lb)
2. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

Updated 3/22/2012

Table A-2
Flare Routine Operation GHG Emission Calculations (EPN: FL-101)
KM Liquids Terminals LLC
Galena Park Terminal

I. Pilot Gas GHG Emissions

Natural Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu	53.02	1.00E-03	1.00E-04
Global Warming Potential (GWP)	1	21	310
lb/MMBtu	116.89	2.20E-03	2.20E-04

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Pilot Gas Flow Rate (scf/hr)	Heat Input (MMBtu/yr)	GHG Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
Pilot Gas Emissions	F-101	150	1340.28	78.33	0.00	0.00	78.41
Emission Totals				***78.33***	***0.00***	***0.00***	***78.41***

Notes:
1. Heat Input (MMBtu/yr) = pilot gas flow rate (scf/hr) x natural gas heat content (1,020 but/scf) x (1 MMBtu / 10^6 Btu) x (8,760 hr/yr)
2. Annual emission rate (tpy) = annual heat input (MMBtu/yr) x emission factor (lb/MMBtu) x (1 ton / 2,000 lbs)
2. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

II. Routine Flare GHG Emission Totals

Operation Type	Pollutant	Emissions (ton/yr)
Routine Flare Operation Emissions	CO_2	78
	CH_4	0
	N_2O	0
	CO_2e	78

Table A-3
Fugitive GHG Emissions (EPN: FUG)
KM Liquids Terminals LLC
Galena Park Terminal

Component Type	Stream Type	Emission Factor SOCMI Without C_2	Number of Components	Control Efficiency	Annual Emissions (tpy)
Valves	Light Liquid	0.0035	990	97%	0.46
	Gas/Vapor	0.0089	990	97%	1.16
	Heavy Liquid	0.0007	990	30%	2.13
Pumps	Light Liquid	0.0386	28	85%	0.70
	Heavy Liquid	0.0161	28	30%	1.36
Flanges	Light Liquid	0.0005	2,970	97%	0.20
	Gas/Vapor	0.0029	2,970	97%	1.13
	Heavy Liquid	0.00007	2,970	30%	0.64
Total Fugitive VOC Emissions					***7.76***
Total Fugitive CO_2e Emissions					***162.92***

Notes:
1. Piping component fugitive emissions conservatively assumed to consist of 100% CH_4 for GHG PSD applicability purposes.
2. CO_2e annual emission rate (tpy) = CH_4 emission rate (tpy) x CH_4 GWP

Table A-4
Marine Loading GHG Emissions (EPNs: MAR-LOADFUG & MAR-VCU)
KM Liquids Terminals LLC
Galena Park Terminal

Basis
Emissions calculated based on loading loss factors (Tables 5.2-1, AP-42, Section 5.2).
Saturation factor assumed to be 0.2 (ships), submerged loading.
VP based on maximum expected liquid temperature for the short-term and annual average liquid temperature for the annual basis.

PRODUCT	LOAD TYPE	Collection Efficiency (%)	MW	Annual Average VP	Annual Loading Loss Factor		Throughput (bbl/yr)		Vapors Routed to Control EPN: MAR-VCU tpy	
Light Naphtha	Ship	95%	66	8.42	2.6228	lb/1000 gal	7,256,200	bbl/yr	379.68	tpy
Heavy Naphtha	Ship	95%	66	4.18	3.2552	lb/1000 gal	6,993,400	bbl/yr	454.16	tpy
								Totals:	***833.84***	***tpy***

Notes:

1. Marine loading activities associated with the proposed condensate splitter will utilize any combination of existing docks at the Galena Park Terminal. Specifically, KMLT will manage the simultaneous loading authorized by this permit at any one or combination of docks such that the emission totals comply with the proposed emission limits.

Table A-5
Controlled Marine Loading GHG Emissions (EPN: MAR-VCU)
KM Liquids Terminals LLC
Galena Park Terminal

I. Pilot/Assist Gas GHG Emissions

Natural Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu	53.02	1.00E-03	1.00E-04
Global Warming Potential (GWP)	1	21	310
lb/MMBtu	116.89	2.20E-03	2.20E-04

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Pilot/Assist Gas Flow Rate (scf/hr)	Heat Input (MMBtu/yr)	Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
Pilot/Assist Gas Emissions	MAR-VCU	480	4288.90	250.66	0.00	0.00	250.91
Emission Totals				***250.66***	***0.00***	***0.00***	***250.91***

Notes:
1. Heat Input (MMBtu/yr) = pilot gas flow rate (scf/hr) x natural gas heat content (1,020 but/scf) x (1 MMBtu / 10^6 Btu) x (8,760 hr/yr)
2. Annual emission rate (tpy) = annual heat input (MMBtu/yr) x emission factor (lb/MMBtu) x (1 ton / 2,000 lb)
3. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

II. Marine Loading Vapor Control GHG Emissions

Naphtha Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu	68.02	3.00E-03	6.00E-04
Global Warming Potential (GWP)	1	21	310
lb/MMBtu	149.96	6.61E-03	1.32E-03

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Annual Vapors lb/yr	Annual Heat Release MMBtu/yr	Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
Ship Loading Vapor Control	MAR-VCU	1,667,681.14	37,225.03	2,791.07	0.12	0.02	2,801.29
				2,791.07	***0.12***	***0.02***	***2,801.29***

Notes:
1. Heat Input (MMBtu/yr) = vapor flow rate (lb/yr) x (1 gal / 5.6 lbs) x naphtha heat content (0.125 MMBu/gal)
2. Annual emission rate (tpy) = annual heat input (MMBtu/hr) x emission factor (lb/MMBtu) x (1 ton / 2,000 lb)
3. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

III. Marine Loading GHG Emission Totals

Operation Type	Pollutant	Emissions (ton/yr)
Ship Loading Vapor Control	CO_2	3,042
	CH_4	0
	N_2O	0
	CO_2e	3,052

Appendix B

MSS Emission Calculation Details

Table B-1
Maintenance, Startup and Shutdown GHG Emissions Summary (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

MSS Activity Type	Emission Rate			
	CO_2	CH_4	N_2O	CO_2e
	tpy	tpy	tpy	tpy
Process Flare	7,281.83	0.00	0.00	7,282.43
Portable Control	278.78	0.01	0.00	316.53
Totals	***7,560.61***	***0.01***	***0.00***	***7,598.97***

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations

Table B-2
Flare MSS GHG Emission Calculations (EPN: FL-101)
KM Liquids Terminals LLC
Galena Park Terminal

I. Pilot Gas GHG Emissions

Natural Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu	53.02	1.00E-03	1.00E-04
Global Warming Potential (GWP)	1	21	310
lb/MMBtu	116.89	2.20E-03	2.20E-04

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Pilot Gas Flow Rate (scf/hr)	Heat Input (MMBtu/yr)	Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
Pilot Gas Emissions	F-101	150	1340.28	78.33	0.00	0.00	78.41
Emission Totals				***78.33***	***0.00***	***0.00***	***78.41***

Notes:
1. Heat Input (MMBtu/yr) = pilot gas flow rate (scf/hr) x natural gas heat content (1,020 but/scf) x (1 MMBtu / 10^6 Btu) x (8,760 hr/yr)
2. Annual emission rate (tpy) = annual heat input (MMBtu/yr) x emission factor (lb/MMBtu) x (1 ton / 2,000 lb)
3. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

Table B-2
Flare MSS GHG Emission Calculations (EPN: FL-101)
KM Liquids Terminals LLC
Galena Park Terminal

II. MSS GHG Emissions

Waste/Purge Gas Combustion Greenhouse Gas Emission Factors

Units	CO_2	N_2O
kg/MMBtu	-	6.00E-04
Global Warming Potential (GWP)	1	310
lb/MMBtu	-	1.32E-03

Unit Startup/Shutdown

Maximum Gas Flow:	25,000	scfh
Duration	500	hrs/yr

Waste Stream								GHG Emissions				
			Flow							Converted to CO2	N_2O	CO_2e
	MW	Number of Carbon Atoms	Mol%	Vol%	lb/yr	MMscf/yr	mol/yr	Controlled GHG Emissions				
Component								Efficiency %	tpy	tpy	tpy	tpy
Nitrogen	28.00	0	0.01%	0.01%	92.35	0.001	3.30	0%	0.00	0.00	0.00	0.00
Hydrogen	2.02	0	0.01%	0.01%	6.66	0.001	3.30	99%	0.00	0.00	0.00	0.00
Methane	16.00	1	0.01%	0.01%	52.77	0.001	3.30	99%	0.00	0.03	0.00	0.03
Ethane	30.07	2	0.01%	0.01%	99.18	0.001	3.30	99%	0.00	0.10	0.00	0.10
Propane	44.09	3	0.01%	0.01%	145.42	0.001	3.30	99%	0.00	0.22	0.00	0.22
Butanes	58.12	4	2.94%	2.94%	56,354.53	0.368	969.66	98%	0.00	110.45	0.00	110.47
Pentanes	72.14	5	37.00%	37.00%	880,385.22	4.625	12,203.17	98%	0.00	2,156.94	0.00	2,157.14
C6+'s	84.16	6	34.61%	34.61%	960,678.63	4.326	11,414.91	98%	0.00	2,824.40	0.00	2,824.58
Hexanes	86.17	6	24.00%	24.00%	682,084.43	3.000	7,915.57	98%	0.00	2,005.33	0.00	2,005.45
Benzene	78.11	6	1.40%	1.40%	36,066.62	0.175	461.74	98%	0.00	106.04	0.00	106.04
Totals			***100.00%***	***100.00%***	***2,615,965.81***	***12.500***	***32,981.53***		***0.00***	***7,203.50***	***0.00***	***7,204.03***

Notes:
1. Controlled GHG emission rate (tpy) = Inlet GHG vapor flow rate (tpy) x (1 - DRE%)
2. Converted to CO_2 emission rate (tpyr) = Inlet vapor flow rate (tpy) x DRE% x Carbon Count (#)
3. N_2O annual emission rate (tpy) = inlet vapor flow rate (scf/yr) x 40 CFR 98, Subpart W process gas HHV (MMBtu/scf) x emission factor (kg/MMBtu) x (2.2046 lb/kg) x (1 ton / 2,000 lbs)
4. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

III. Flare MSS GHG Emission Totals

Operation Type	Pollutant	Emissions (ton/yr)
Routine Flare Operation Emissions	CO_2	7,282
	CH_4	0
	N_2O	0
	CO_2e	7,282

Updated 3/22/2012

Table B-3
Controlled IFR Tank Roof Landing GHG MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Constants

Date Roof Landed		07/01/11	
Date Drained Dry or Roof Floated		07/04/11	
Number of Days Roof Off-Float	n_d	3.00	(days)
Atmospheric Pressure	Pa	14.70	(psia)
Max Daily Ambient Temperature	T_{MAX}	92.70	(deg F)
Min Daily Ambient Temperature	T_{MIN}	72.40	(deg F)
Daily Total Solar Insulation Factor	I	1887.12	[BTU/(ft2*day)]
Daily Average Ambient Temperature	T_{AA}	542.15	(deg R)

Tank ID	Dia.	High Roof Leg Height	Status Prior to Re-Filling (1)	Height of Liquid Heel	Product Stored (2)	RVP	Molecular Weight	Stock Liquid Density	Slope of ASTM Distillation Curve	Height of Vapor Space	Volume of Vapor Space	Tank Solar Absorptance Factor	Daily Vapor Temp. Range	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.	Antoine's Equation Constant	Antoine's Equation Constant	True Vapor Pressure of Stock Liquid	Vapor Space Expansion Factor	Standing Idle Saturation Factor	Not to Exceed Standing Idle Losses	Calculated Standing Idle Losses	Uncontrolled Standing Idle Losses	Uncontrolled Filling Losses	MSS Roof Landings (3)	Vapors Routed to Control
	D			H_{le}			M_V	W_l	S	h_V	V_V	alpha	delta T	T_B	T_{LA}	A	B	P	K_E	K_s		L_s		L_F		
	(ft)	(ft)		(ft)			(lb/lb-mol)	(lb/gal)		(ft)	(ft^3)		(deg R)	(deg R)	(deg R)			(psia)			(lbs)	(lbs)	(lbs)	(lbs)	(events/year)	(tpy)
200-201	174	5.00	Drain	0.001	Feed Stock	13	66	5.6	3.5	5.00	118,869.80	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	8,806.01	838.91	838.91	2,201.50	1	**1.52**
200-202	174	5.00	Drain	0.001	Feed Stock	13	66	5.6	3.5	5.00	118,869.80	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	8,806.01	838.91	838.91	2,201.50	1	**1.52**
200-203	174	5.00	Drain	0.001	Feed Stock	13	66	5.6	3.5	5.00	118,869.80	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	8,806.01	838.91	838.91	2,201.50	1	**1.52**
100-201	123	5.00	Drain	0.001	Light Naphtha	13	66	5.6	3.5	5.00	59,399.56	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	4,400.39	419.21	419.21	1,100.10	1	**0.76**
100-202	123	5.00	Drain	0.001	Light Naphtha	13	66	5.6	3.5	5.00	59,399.56	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	4,400.39	419.21	419.21	1,100.10	1	**0.76**
100-209	123	5.00	Drain	0.001	Light Naphtha	13	66	5.6	3.5	5.00	59,399.56	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	4,400.39	419.21	419.21	1,100.10	1	**0.76**
100-203	123	5.00	Drain	0.001	Heavy Naphtha	7	66	5.6	2.5	5.00	59,399.56	0.17	23.60	542.17	544.70	12.02	5605.16	5.62	0.18	0.40	2,261.28	419.21	419.21	565.32	1	**0.49**
100-204	123	5.00	Drain	0.001	Heavy Naphtha	7	66	5.6	2.5	5.00	59,399.56	0.17	23.60	542.17	544.70	12.02	5605.16	5.62	0.18	0.40	2,261.28	419.21	419.21	565.32	1	**0.49**
100-210	123	5.00	Drain	0.001	Heavy Naphtha	7	66	5.6	2.5	5.00	59,399.56	0.17	23.60	542.17	544.70	12.02	5605.16	5.62	0.18	0.40	2,261.28	419.21	419.21	565.32	1	**0.49**
5-201	41	5.00	Drain	0.001	Wastewater	13	66	5.6	3.5	5.00	6,599.95	0.17	23.60	542.17	544.70	11.50	4962.83	10.93	0.62	0.26	488.93	46.58	46.58	122.23	1	**0.08**
																								Totals	***10***	***8.40***

Notes
1. Codes for tank status before re-fill: Full Heel (FULL) Partial Heel (PARTIAL) Drain Dry (DRAIN)
2. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-4
Equipment Venting GHG MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Emissions Summary	tpy
Equipment MSS Vapors Vented (See Table 9 for controlled emissions details)	0.31
Equipment Refilling	5.92

Equipment ID		Pump	Filter/Meter/ Valve	Vessels and Piping	Vapors Routed to Control (EPN: MSS)
Annual Venting/Draining/Refilling Events	events/yr	20	20	10	
Short-Term Venting/Draining/Refilling Events	simultaneous events	3	3	1	
Molecular Weight of Vapor	lb/lb-mole	66	66	66	
Daily Avg. Liquid Surface Temp.	°R	544.77	544.77	544.77	
Vapor Pressure at Max. Storage Temp.	psia	11.00	11.00	11.00	
Volume	ft^3/event	85.00	85.00	15,550.88	
Equipment MSS Vapors Vented (See Table B-8 for controlled emission details)					
Vented to Control	Yes/No	Yes	Yes	Yes	
Moles	M_v/event	0.160	0.160	29.264	
Total Venting VOC Emissions	tpy	0.11	0.11	0.10	***0.31***
Equipment MSS Refilling					
Vented to Control	Yes/No	Yes	Yes	Yes	
Equipment VOC Loading Loss	lbs/1,000 gals loaded	9.96	9.96	9.96	
Recovery VOC Loading Loss	lbs/event	6.33	6.33	1,158.92	
Recovery VOC Loading Loss	tpy	0.06	0.06	5.79	***5.92***

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-5
Air Mover and VacuumTruck MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Basis - Air Mover & Vacuum Mover (Control & No Control)
Emissions calculated based on loading loss equation (Equation 1, AP-42, Section 5.2)
Saturation factor assumed to be 1.45, splash loading.
Volume of vapor displaced is two times the volume of liquid transferred. This is to account for the vacuum hose sucking air during part of the transfer.

Load Type and Control Method	Product	Vapor MW	VP		Loading Loss		Throughput		Vapors Routed to Control (EPN: MSS) tpy	
Air Mover& Vacuum Mover - Thermal Control	High Vapor Pressure Products	66	11	psia	1020.18	lb/1000bbl	1,275	bbl/yr	1.30	tpy
Air Mover & Vacuum Mover - Thermal Control	Low Vapor Pressure Products	130	0.5	psia	91.34	lb/1000bbl	1,275	bbl/yr	0.12	tpy
								Totals	***1.44***	***tpy***

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Updated 3/22/2012

Table B-6
Frac Tank GHG MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Filling Basis
Emissions calculated based on loading loss factors (Tables 5.2-1, AP-42, Section 5.2).
Saturation factor assumed to be 0.6, tank truck submerged loading dedicated service.

Product	Load Type	MW	Max VP	Loading Loss Factor		Annual Throughput (bbl/yr)		Vapors Routed to Control tpy (50 tanks)	
Misc. Process Liquids	Submerged Load	66	11	10.0511	lb/1000 gal	7,143	bbl/yr	1.51	tpy
							Totals	***1.51***	***tpy***

Sample Equation for Filling Emissions (tpy)
$L_{L\ (lbs/Mgal)}$ = 12.46 SPM/T
(12.46) x (0.6) x (66) x (11) / (460 + 80) = 10.05 lb/Mgal
(10.05 lb/Mgal) / (1000 gal/Mgal) x (7,143 bbl/yr x 42 gals/bbl) x (1-0.99) = 1.51 tpy

Breathing Emissions

Tank Data	
Shell Length (ft)	46.67
Diameter (ft)	8.75
Volume (gallons)	18,000
Turnovers:	1
Net Throughput (gal/yr)	18,000

Emissions per Frac Tank

Tank	Contents	Maximum Breathing Loss (lb/month) (1)
Frac Tank	Misc. Process Liquids	230.46

Short-Term Breathing Vapors Routed to Control

Number of idle tanks per hour:	10	tanks
Breathing Emissions per yr (3):	**1.96**	**tpy**

Annual Breathing and Working Vapors Routed to Control

Number of Tanks/year:	17	tanks
Total Annual Emissions (4):	**3.47**	**tons**

Notes:
1. Based on Tanks 4.0 monthly printout.
2. For cap calculation purposes, assumed each frac tank will be in service for thirty days.
3. Total tpy = annual emissions (tpy) x number of tanks/yr
4. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-7
Controlled GHG MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

I. Pilot/Assist Gas GHG Emissions

Natural Gas External Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu	53.02	1.00E-03	1.00E-04
Global Warming Potential (GWP)	1	21	310
lb/MMBtu	116.89	2.20E-03	2.20E-04

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Pilot/Assist Gas Flow Rate	Heat Input (MMBtu/hr)	Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
Pilot/Assist Gas Emissions	MSS	480	0.49	250.66	0.00	0.00	250.91
Emission Totals				***250.66***	***0.00***	***0.00***	***250.91***

Notes:
1. Heat Input (MMBtu/yr) = pilot/assist gas flow rate (scf/hr) x natural gas heat content (1,020 but/scf) x (1 MMBtu / 10^6 Btu) x (8,760 hr/yr)
2. Annual emission rate (tpy) = annual heat input (MMBtu/hr) x emission factor (lb/MMBtu) x (1 ton / 2,000 lb)
3. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

II. MSS Vapor Control GHG Emissions

Naphtha Combustion Greenhouse Gas Emission Factors

Units	CO_2	CH_4	N_2O
kg/MMBtu	68.02	3.00E-03	6.00E-04
Global Warming Potential (GWP)	1	21	310
lb/MMBtu	149.96	6.61E-03	1.32E-03

Notes:
1. Emission factors obtained from 40 CFR 98, Subchapter C, Tables C-1 and C-2 and converted from kg/MMBtu to lb/MMBtu by multiplying by 2.2046 lb/kg.
2. Global warming potentials obtained from 40 CFR 98, Subpart A, Table A-1.

Description	EPN	Annual Vapors lb/yr	Annual Heat Release MMBtu/yr	Emissions CO_2 tpy	CH_4 tpy	N_2O tpy	CO_2e tpy
FR Tank Roof Landings	MSS	16,801.55	375.03	28.12	0.00	0.00	28.22
Equipment Venting	MSS	12,458.00	278.08	20.85	0.00	0.00	20.93
Air Mover and VacuumTruck	MSS	2,875.81	64.19	4.81	0.00	0.00	4.83
Frac Tank	MSS	6,933.14	154.76	11.60	0.00	0.00	11.65
				28.12	***0.00***	***0.00***	***65.63***

Notes:
1. Heat Input (MMBtu/yr) = vapor flow rate (lbs/yr) x (1 gal / 5.6 lbs) x naphtha heat content (0.125 MMBu/gal)
2. Annual emission rate (tpy) = annual heat input (MMBtu/hr) x emission factor (lb/MMBtu) x (1 ton / 2,000 lb)
3. CO_2e annual emission rate (tpy) = CO_2 emission rate (tpy) x CO_2 GWP + CH_4 emission rate (tpy) x CH_4 GWP + N_2O emission rate (tpy) x N_2O GWP

III. Marine Loading GHG Emission Totals

Operation Type	Pollutant	Emissions (ton/yr)
Controlled MSS	CO_2	279
	CH_4	0
	N_2O	0
	CO_2e	317

Appendix C

RACT/BACT/LAER Clearinghouse Search Tables

RBLC Database Search Results for GHG Emissions from Heaters and Boilers

RBLCID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Thruput	Thruput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units
AL-0231	NUCOR DECATUR LLC	NUCOR CORPORATION	AL	06/12/2007 ACT	VACUUM DEGASSER BOILER	NATURAL GAS	95	MMBTU/H	Carbon Dioxide		0.061	LB/MMBTU
*FL-0330	PORT DOLPHIN ENERGY LLC		FL	12/01/2011 ACT	Boilers (4 - 278 mmbtu/hr each)	natural gas	0		Carbon Dioxide	tuning, optimization, instrumentation and controls, insulation, and turbulent flow.	117	LB/MMBTU
LA-0248	DIRECT REDUCTION IRON PLANT	CONSOLIDATED ENVIRONMENTAL MANAGEMENT INC - NUCOR	LA	01/27/2011 ACT	DRI-108 - DRI Unit #1 Reformer Main Flue Stack	Iron Ore and Natural Gas	12168	Billion Btu/yr	Carbon Dioxide	the best available technology for controlling CO2e emissions from the DRI Reformer is good combustion practices, the Acid gas separation system, and Energy integration. BACT shall be good combustion practices, which will be adhered to maintain low levels of fuel consumption by the LNB burners.	11.79	MMBTU/TON OF DRI
LA-0248	DIRECT REDUCTION IRON PLANT	CONSOLIDATED ENVIRONMENTAL MANAGEMENT INC - NUCOR	LA	01/27/2011 ACT	DRI-208 - DRI Unit #2 Reformer Main Flue Stack	Iron ore and Natural Gas	12168	Billion Btu/yr	Carbon Dioxide	the best available technology for controlling CO2e emissions from the DRI Reformer is good combustion practices, the Acid gas separation system, and Energy integration. BACT shall be good combustion practices, which will be adhered to maintain low levels of fuel consumption by the LNB burners.	11.79	MMBTU/TON OF DRI
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	ENTERGY LOUISIANA LLC	LA	08/16/2011 ACT	AUXILIARY BOILER (AUX-1)	NATURAL GAS	338	MMBTU/H	Carbon Dioxide	PROPER OPERATION AND GOOD COMBUSTION PRACTICES	117	LB/MMBTU

RBLCID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Thruput	Thruput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	ENTERGY LOUISIANA LLC	LA	08/16/2011 ACT	AUXILIARY BOILER (AUX-1)	NATURAL GAS	338	MMBTU/H	Methane	PROPER OPERATION AND GOOD COMBUSTION PRACTICES	0.0022	LB/MMBTU

RBLCID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Thruput	Thruput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Units
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	ENTERGY LOUISIANA LLC	LA	08/16/2011 ACT	AUXILIARY BOILER (AUX-1)	NATURAL GAS	338	MMBTU/H	Nitrous Oxide (N2O)	PROPER OPERATION AND GOOD COMBUSTION PRACTICES	0.0002	LB/MMBTU

Appendix D

TCEQ Permit Application

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February 22, 2012 FedEx# 7932 5878 1949

Mr. Mike Wilson, P.E.
Texas Commission on Environmental Quality
Air Permits Division (MC-163)
Office of Permitting, Remediation, and Reporting
P.O. Box 13087
Austin, TX 78711-3087

Re: Air Quality Permit Application
KM Liquids Terminals LLC – Galena Park Terminal
Galena Park, Harris County
Customer Reference Number: CN603254707
Regulated Entity Number: RN100237452

Dear Mr. Wilson:

On behalf of KM Liquids Terminals LLC (KMLT), RPS is hereby submitting the enclosed air quality permit application to authorize the construction and operation of a 100,000 bbl/day condensate splitter at the existing KMLT Galena Park Terminal. The project is subject to Non-Attainment New Source Review (NNSR); therefore, this application also serves as the NNSR permit application.

The enclosures include all of the forms, tables, calculations, and additional information needed to satisfy the requirements of 30 TAC §116.111 and §116.150. The permit fee, with a copy of the TCEQ PI-1, has been sent to the TCEQ Financial Division under separate cover.

We wish to thank you in advance for you consideration of this application. If you should have any questions during your review, please feel free to contact me at 832-239-8018 or Ms. Christina Harris of KMLT at 713-369-8760.

Sincerely,
RPS

Neal A. Nygaard
Manager, Houston Office

Enclosures

cc: Mr. Manuel Bautista, Air Section Manager, TCEQ Region 12, Houston, TX
FedEx# 7932 5880 8950
Mr. Michael Schaffer, Director, Pollution Control Division, FedEx# 7980 8931 3148
Harris County Public Health and Environmental Services, Pasadena, TX
Mrs. Stephanie Kordzi, Environmental Engineer, U.S. Environmental Protection Agency, Region VI, Dallas, TX (Electronic Copy Only)
Ms. Christina Harris, KM Liquids Terminals LLC, Houston, TX FedEx# 7932 5875 1946

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Application for
Texas Commission on Environmental Quality
Air Quality Permit

KM Liquids Terminals LLC
Galena Park Terminal
Galena Park, Harris County, Texas

RN100237452
CN603254707

February 2012

STATE OF TEXAS
SHANON G. DISORBO
97020
LICENSED
PROFESSIONAL ENGINEER

RPS
(TBPE No. 1298)

2/21/12

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Section 1
Introduction

KM Liquids Terminals LLC (KMLT) owns and operates a for-hire bulk petroleum terminal (Galena Park Terminal) located in Galena Park, Harris County, Texas that receives, stores, and transfers petroleum products and specialty chemicals. The facility consists of various storage tanks and their associated piping, truck racks, rail car racks, barge docks, ship docks, and control equipment that are currently operated under New Source Review (NSR) Permit No. 2193, Permit-By-Rule (PBR), and Standard Permit.

1.1 Purpose of this Application

This document constitutes an application from KMLT for the required Texas Commission on Environmental Quality (TCEQ) air permit for a new 100,000 bbl/day condensate splitter at the existing KMLT Galena Park Terminal, to be constructed in two 50,000 bbl/day phases. The proposed condensate splitter will consist of two trains which will each process 50,000 bbl/day of hydrocarbon condensate material to obtain products suitable for commercial use. Construction of the second 50,000 bbl/day train will commence within 18 months of completion of the first 50,000 bbl/day train. The process will utilize conventional distillation technology. Table 1-1 presents a summary of the proposed facility project emissions compared to Prevention of Significant Deterioration (PSD) and Non-Attainment New Source Review (NNSR) applicability thresholds. The proposed project is subject to NNSR for VOC and NO_x; therefore, this application also serves as the required NNSR permit application. The proposed project is also subject to PSD review for green house gases, for which KMLT will submit an application to the Environmental Protection Agency (EPA). This application includes both routine and planned maintenance, startup, and shutdown (MSS) emissions.

1.2 Application Organization

This application is organized into the following sections:

Section 1 presents the application objectives and organization;

Section 2 contains TCEQ administrative Form PI-1;

Section 3 contains an Area Map showing the facility location, a Plot Plan showing the location of the facilities referenced in this submittal, and a Plot Plan for the proposed condensate splitter;

Section 4 contains a discussion of the estimated emissions and a completed TCEQ Table 1(a);

Section 5 presents the BACT and/or LAER analysis for the facilities included in this application;

Section 6 contains information on the permit application fee, Table 30, and a copy of the fee check;

Section 7 contains a process description for the Galena Park Terminal;

Section 8 addresses applicability of the federal NNSR and PSD permitting requirements;

Section 9 presents the General Application Requirements that address the applicability for state and federal air regulations for the facilities included in this application;

Appendix A contains detailed emissions calculations for routine operations;

Appendix B contains detailed emission calculations for MSS activities;

Appendix C contains the results of the RACT/BACT/LAER Clearinghouse (RBLC) search that supports the BACT/LAER analysis in Section 5; and

Appendix D contains TCEQ permit tables.

Table 1-1
NNSR/PSD Applicability Analysis Summary
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Included in Construction Phase	VOC			NOx			CO			SO2			PM/PM10			PM2.5		
		Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change	Baseline	Proposed	Change
		tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy
F-101	1	-	2.43	2.43	-	2.71	2.71	-	16.67	16.67	-	2.71	2.71	-	3.36	3.36	-	2.26	2.26
F-102	1	-	1.97	1.97	-	2.19	2.19	-	13.50	13.50	-	2.19	2.19	-	2.72	2.72	-	1.83	1.83
F-201	2	-	2.43	2.43	-	2.71	2.71	-	16.67	16.67	-	2.71	2.71	-	3.36	3.36	-	2.26	2.26
F-202	2	-	1.97	1.97		2.19	2.19		13.50	13.50		2.19	2.19		2.72	2.72		1.83	1.83
FL-101	1	-	0.71	0.71	-	0.62	0.62	-	2.28	2.28	-	0.00	0.00	-	-	-	-	-	-
200-201	1	-	4.62	4.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200-202	1	-	4.62	4.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200-203	2	-	4.62	4.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-201	1	-	1.90	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-202	1	-	1.90	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-209	2	-	1.90	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-203	1	-	0.86	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-204	1	-	0.86	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-210	2	-	0.86	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-201	1	-	0.99	0.99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-205	1	-	2.92	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-206	1	-	2.92	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-211	2	-	2.92	2.92	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-207	1	-	3.64	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-208	1	-	3.64	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-212	2	-	3.64	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-201	1	-	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-201	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-202	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-203	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-204	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-205	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-206	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-207	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG	1	-	3.88	3.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUG	2	-	3.88	3.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAR-LOADFUG	1	-	22.32	22.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAR-LOADFUG	2	-	22.32	22.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAR-VCU	1	-	4.17	4.17	-	1.41	1.41	-	1.88	1.88	-	0.01	0.01	-	-	-	-	-	-
MAR-VCU	2	-	4.17	4.17	-	1.41	1.41	-	1.88	1.88	-	0.01	0.01	-	-	-	-	-	-
MSS	1	-	2.30	2.30	-	1.42	1.42	-	5.43	5.43	-	0.07	0.07	-	0.16	0.16	-	0.16	0.16
MSS	2	-	1.61	1.61	-	1.28	1.28	-	5.16	5.16	-	0.07	0.07	-	0.11	0.11	-	0.11	0.11
TNK-TRANS[1]	1	-	5.00	5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase I Project Increas (tpy)				***71.69***			***8.35***			***39.77***			***4.98***			***6.24***			***4.24***
Phase II Project Incrase (tpy)				***50.33***			***7.59***			***37.21***			***4.98***			***6.20***			***4.20***
Combined Project Increase (tpy)				***122.01***			***15.94***			***76.98***			***9.95***			***12.44***			***8.44***
Netting Threshold (tons)				***5***			***5***			***100***			***40***			***25/15***			***10***
Netting Required (Yes/No)				***Yes***			***Yes***			***No***			***No***			***No***			***No***
Contemporaneous Period Change (tons)				***> 25***			***> 25***			***-***			***-***			***-***			***-***
Significant Modification Threshold (tons)				***25***			***25***			***100***			***40***			***25/15***			***10***
Federal Revew Required (Yes/No)				***Yes***			***Yes***			***No***			***No***			***No***			***No***

Notes:
1. All of the existing Galena Park Terminal storage tanks are considered affected facilities for NNSR and PSD applicability purposes. Projected actual emission increases (i.e., storage tank working emissions) associated with additional product from the proposed condensate splitter are 5 tpy.

Section 2
Administrative Forms

This section contains the following TCEQ forms:

- Form PI-1, General Application for Air Preconstruction Permits and Amendments

Texas Commission on Environmental Quality
Form PI-1 General Application for
Air Preconstruction Permit and Amendment

Important Note: The agency **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued *and* no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to www.tceq.texas.gov/permitting/central_registry/guidance.html.

I. Applicant Information		
A. Company or Other Legal Name: KM Liquids Terminals LLC		
Texas Secretary of State Charter/Registration Number (*if applicable*):		
B. Company Official Contact Name: Ms Christina Harris		
Title: Compliance Assurance Manager		
Mailing Address: 500 Dallas St., Suite 1000		
City: Houston	State: TX	ZIP Code: 77002
Telephone No.: 713-205-1233	Fax No.:	E-mail Address: Christina_Harris@kindermorgan.com
C. Technical Contact Name: Mr. Neal A. Nygaard		
Title: Manager, Houston Office		
Company Name: RPS		
Mailing Address: 14450 JFK Blvd., Suite 400		
City: Houston	State: TX	ZIP Code: 77032
Telephone No.: 832-239-8018	Fax No.: 281-987-3500	E-mail Address: nygaardn@rpsgroup.com
D. Site Name: Galena Park Terminal		
E. Area Name/Type of Facility: Condensate Splitter	☒ Permanent ☐ Portable	
F. Principal Company Product or Business: Bulk Liquids Terminal		
Principal Standard Industrial Classification Code (SIC): 4226		
Principal North American Industry Classification System (NAICS):		
G. Projected Start of Construction Date: 1/1/2013		
Projected Start of Operation Date: 1/1/2014		
H. Facility and Site Location Information (If no street address, provide clear driving directions to the site in writing.):		
Street Address: 906 Clinton Drive		
City/Town: Galena Park	County: Harris	ZIP Code: 77547
Latitude (nearest second):	Longitude (nearest second):	

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I. Applicant Information (continued)	
I. Account Identification Number (leave blank if new site or facility): HG-0262-H	
J. Core Data Form.	
Is the Core Data Form (Form 10400) attached? If *No*, provide customer reference number and regulated entity number (complete K and L).	☐ YES ☒ NO
K. Customer Reference Number (CN): CN603254707	
L. Regulated Entity Number (RN): RN100237452	
II. General Information	
A. Is confidential information submitted with this application? If *Yes*, mark each **confidential** page **confidential** in large red letters at the bottom of each page.	☐ YES ☒ NO
B. Is this application in response to an investigation or enforcement action? If *Yes*, attach a copy of any correspondence from the agency.	☐ YES ☒ NO
C. Number of New Jobs: 15	
D. Provide the name of the State Senator and State Representative and district numbers for this facility site:	
Senator: Mario Gallegos	District No.: 6
Representative: Ana Hernandez Luna	District No.: 143
III. Type of Permit Action Requested	
A. Mark the appropriate box indicating what type of action is requested. Initial ☒ Amendment ☐ Revision (30 TAC 116.116(e)) ☐ Change of Location ☐ Relocation ☐	
B. Permit Number (if existing):	
C. Permit Type: Mark the appropriate box indicating what type of permit is requested. *(check all that apply, skip for change of location)* Construction ☒ Flexible ☐ Multiple Plant ☐ Nonattainment ☒ Prevention of Significant Deterioration ☐ Hazardous Air Pollutant Major Source ☐ Plant-Wide Applicability Limit ☐ Other:__________	
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with 30 TAC 116.315(c).	☐ YES ☒ NO

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III. Type of Permit Action Requested (continued)			
E. Is this application for a change of location of previously permitted facilities? If Yes, complete III.E.1 - III.E.4.			☐ YES ☒ NO
1. Current Location of Facility (If no street address, provide clear driving directions to the site in writing.):			
Street Address:			
City:	County:	ZIP Code:	
2. Proposed Location of Facility (If no street address, provide clear driving directions to the site in writing.):			
Street Address:			
City:	County:	ZIP Code:	
3. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions? If *No*, attach detailed information.			☐ YES ☐ NO
4. Is the site where the facility is moving considered a major source of criteria pollutants or HAPs?			☐ YES ☐ NO
F. Consolidation into this Permit: List any standard permits, exemptions or permits by rule to be consolidated into this permit including those for planned maintenance, startup, and shutdown.			
List: Not Applicable			
G. Are you permitting planned maintenance, startup, and shutdown emissions? If *Yes*, attach information on any changes to emissions under this application as specified in VII and VIII.			☒ YES ☐ NO
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability)			
Is this facility located at a site required to obtain a federal operating permit? If *Yes*, list all associated permit number(s), attach pages as needed).			☒ YES ☐ NO ☐ To be determined
Associated Permit No (s.): O988			
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this application is approved.			
FOP Significant Revision ☒	FOP Minor ☐	Application for an FOP Revision ☐	To Be Determined ☐
Operational Flexibility/Off-Permit Notification ☐	Streamlined Revision for GOP ☐	None ☐	

Texas Commission on Environmental Quality
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III. Type of Permit Action Requested (continued)	
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) *(continued)*	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
GOP Issued ☐	GOP application/revision application submitted or under APD review ☐
SOP Issued ☐	SOP application/revision application submitted or under APD review ☒
IV. Public Notice Applicability	
A. Is this a new permit application or a change of location application?	☒ YES ☐ NO
B. Is this application for a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	☐ YES ☒ NO
C. Is this an application for a major modification of a PSD, nonattainment, FCAA 112(g) permit, or exceedance of a PAL permit?	☒ YES ☐ NO
D. Is this application for a PSD or major modification of a PSD located within 100 kilometers of an affected state?	☐ YES ☒ NO
If *Yes*, list the affected state(s).	
E. Is this a state permit amendment application? If Yes, complete IV.E.1. – IV.E.3.	☐ YES ☒ NO
1. Is there any change in character of emissions in this application?	☐ YES ☐ NO
2. Is there a new air contaminant in this application?	☐ YES ☐ NO
3. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☐ NO
F. List the total annual emission increases associated with the application (*list* **all** *that apply and attach additional sheets as needed*):	
Volatile Organic Compounds (VOC): 122.01 tpy	
Sulfur Dioxide (SO_2): 9.95 tpy	
Carbon Monoxide (CO): 76.98 tpy	
Nitrogen Oxides (NO_x): 15.94 tpy	
Particulate Matter (PM): 12.44 tpy	
PM $_{10}$ microns or less (PM_{10}): 12.44 tpy	
PM $_{2.5}$ microns or less ($PM_{2.5}$): 8.44 tpy	
Lead (Pb): NA	
Hazardous Air Pollutants (HAPs): > 5 tpy	
Other speciated air contaminants **not** listed above: NA	

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V. Public Notice Information (complete if applicable)		
A. Public Notice Contact Name: Ms. Christina Harris		
Title: Compliance Assurance Manager		
Mailing Address: 500 Dallas St., Suite 1000		
City: Houston	State: TX	ZIP Code:
B. Name of the Public Place: Galena Park Branch Library		
Physical Address (No P.O. Boxes): 1500 Keene St.		
City: Galena Park	County: Harris	ZIP Code: 77547
The public place has granted authorization to place the application for public viewing and copying.		☒ YES ☐ NO
The public place has internet access available for the public.		☒ YES ☐ NO
C. Concrete Batch Plants, PSD, and Nonattainment Permits		
1. County Judge Information (For Concrete Batch Plants and PSD and/or Nonattainment Permits) for this facility site.		
The Honorable: Edward M. Emmett		
Mailing Address: 1001 Preston, Suite 911		
City: Houston	State: TX	ZIP Code: 77002
2. Is the facility located in a municipality or an extraterritorial jurisdiction of a municipality? *(For Concrete Batch Plants)*		☐ YES ☐ NO NA
Presiding Officers Name(s): NA		
Title: NA		
Mailing Address: NA		
City: NA	State: NA	ZIP Code: NA
3. Provide the name, mailing address of the chief executives of the city and county, Federal Land Manager, or Indian Governing Body for the location where the facility is or will be located.		
Chief Executive: R.P. “Bobby” Barrett, Mayor of Galena Park		
Mailing Address: 2000 Clinton		
City: Galena Park	State: TX	ZIP Code: 77547
Name of the Federal Land Manager: NA		
Title: NA		
Mailing Address: NA		
City: NA	State: NA	ZIP Code: NA

V. Public Notice Information (complete if applicable) (continued)	
3. Provide the name, mailing address of the chief executives of the city and county, State, Federal Land Manager, or Indian Governing Body for the location where the facility is or will be located. *(continued)*	
Name of the Indian Governing Body: NA	
Title: NA	
Mailing Address: NA	
City: NA / State: NA / ZIP Code: NA	
D. Bilingual Notice	
Is a bilingual program **required** by the Texas Education Code in the School District?	☒ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	☒ YES ☐ NO
If *Yes*, list which languages are required by the bilingual program? Spanish	
VI. Small Business Classification (Required)	
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	☐ YES ☒ NO
B. Is the site a major stationary source for federal air quality permitting?	☒ YES ☐ NO
C. Are the site emissions of any regulated air pollutant greater than or equal to 50 tpy?	☒ YES ☐ NO
D. Are the site emissions of all regulated air pollutants combined less than 75 tpy?	☐ YES ☒ NO
VII. Technical Information	
A. The following information must be submitted with your Form PI-1 (this is just a checklist to make sure you have included everything)	
1. Current Area Map ☒ - See Section 3 of the application.	
2. Plot Plan ☒ - See Section 3 of the application.	
3. Existing Authorizations ☒ - See Section 1 of the application.	
4. Process Flow Diagram ☒ - See Section 7 of the application.	
5. Process Description ☒ - See Section 7 of the application.	
6. Maximum Emissions Data and Calculations ☒ - See Section 4, Appendix A, and Appendix B of the application.	
7. Air Permit Application Tables ☒ - See Section 2 of the application.	
a. Table 1(a) (Form 10153) entitled, Emission Point Summary ☒ - See Section 4 of the application.	
b. Table 2 (Form 10155) entitled, Material Balance ☒ - See Appendix D of the application.	
c. Other equipment, process or control device tables ☒ - Detailed equipment, process, and control device information is included in the emission calculations in Appendix A of the application.	

VII. Technical Information			
B. Are any schools located within 3,000 feet of this facility?			☐ YES ☒ NO
C. Maximum Operating Schedule:			
Hours: 24	Day(s): 7	Week(s): 52	Year(s): 20
Seasonal Operation? If Yes, please describe in the space provide below.			☐ YES ☒ NO
D. Have the planned MSS emissions been previously submitted as part of an emissions inventory?			☐ YES ☒ NO
Provide a list of each planned MSS facility or related activity and indicate which years the MSS activities have been included in the emissions inventories. Attach pages as needed.			
E. Does this application involve any air contaminants for which a *disaster review* is required?			☐ YES ☒ NO
F. Does this application include a pollutant of concern on the *Air Pollutant Watch List (APWL)*?			☒ YES ☐ NO
VIII. State Regulatory Requirements **Applicants must demonstrate compliance with all applicable state regulations to obtain a permit or amendment**. *The application must contain detailed attachments addressing applicability or non applicability; identify state regulations; show how requirements are met; and include compliance demonstrations.*			
A. Will the emissions from the proposed facility protect public health and welfare, and comply with all rules and regulations of the TCEQ?			☒ YES ☐ NO
B. Will emissions of significant air contaminants from the facility be measured?			☒ YES ☐ NO
C. Is the Best Available Control Technology (BACT) demonstration attached?			☒ YES ☐ NO
D. Will the proposed facilities achieve the performance represented in the permit application as demonstrated through recordkeeping, monitoring, stack testing, or other applicable methods?			☒ YES ☐ NO
IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** *The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.*			
A. Does Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?			☒ YES ☐ NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?			☒ YES ☐ NO
C. Does 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application?			☒ YES ☐ NO

IX. Federal Regulatory Requirements **Applicants must demonstrate compliance with all applicable federal regulations to obtain a permit or amendment** ***The application must contain detailed attachments addressing applicability or non applicability; identify federal regulation subparts; show how requirements are met; and include compliance demonstrations.***	
D. Do nonattainment permitting requirements apply to this application?	☒ YES ☐ NO
E. Do prevention of significant deterioration permitting requirements apply to this application?	☐ YES ☒ NO
F. Do Hazardous Air Pollutant Major Source [FCAA 112(g)] requirements apply to this application?	☐ YES ☒ NO
G. Is a Plant-wide Applicability Limit permit being requested?	☐ YES ☒ NO
X. Professional Engineer (P.E.) Seal	
Is the estimated capital cost of the project greater than $2 million dollars?	☒ YES ☐ NO
If *Yes*, submit the application under the seal of a Texas licensed P.E.	
XI. Permit Fee Information	
Check, Money Order, Transaction Number ,ePay Voucher Number:	Fee Amount: $75,000
Company name on check: KM Liquids Terminals LLC	Paid online?: ☐ YES ☒ NO
Is a copy of the check or money order attached to the original submittal of this application?	☒ YES ☐ NO ☐ N/A
Is a Table 30 (Form 10196) entitled, Estimated Capital Cost and Fee Verification, attached?	☒ YES ☐ NO ☐ N/A

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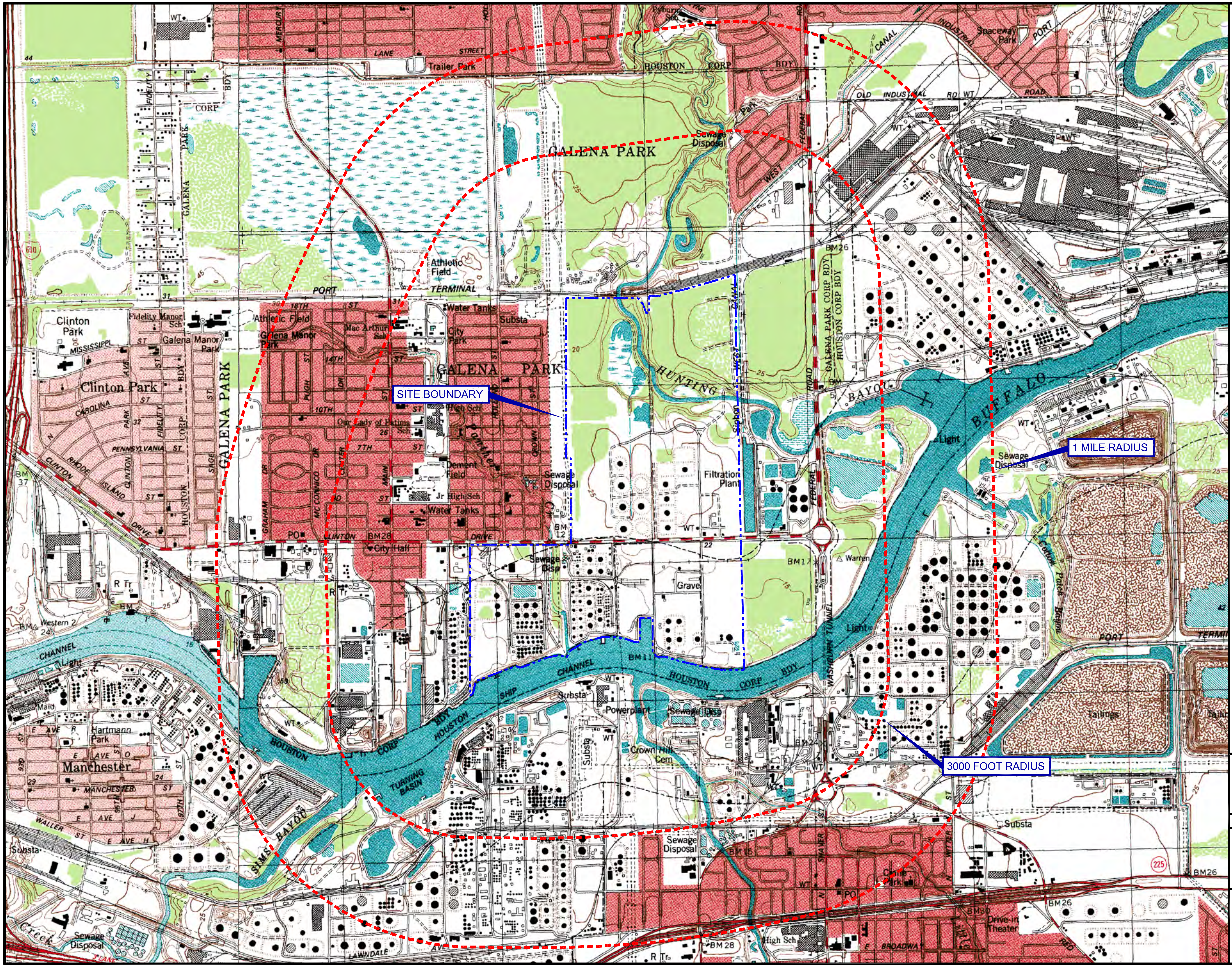
XII. Delinquent Fees and Penalties
This form **will not be processed** until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ is paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.
XIII. 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. 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, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations 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: William P. Brown
Signature: W. P. Brown *Original Signature Required*
Date: 2/21/12

Section 3
Area Map and Plot Plan

An area map is provided in Figure 3-1 which details the 3,000-foot and one-mile distance markings. An overall plot plan of the Galena Park Terminal is provided in Figure 3-2. A detailed plot plan for the proposed condensate splitter and the associated facilities is provided in Figure 3-3.



Map Source: USGS 7.5 Min. Quad Sheets JACINTO CITY, TX., 1982; PARK PLACE, TX., 1982; PASADENA, TX., 1982; SETTEGAST, TX., 1982.

N

0 2000
SCALE IN FEET

TEXAS

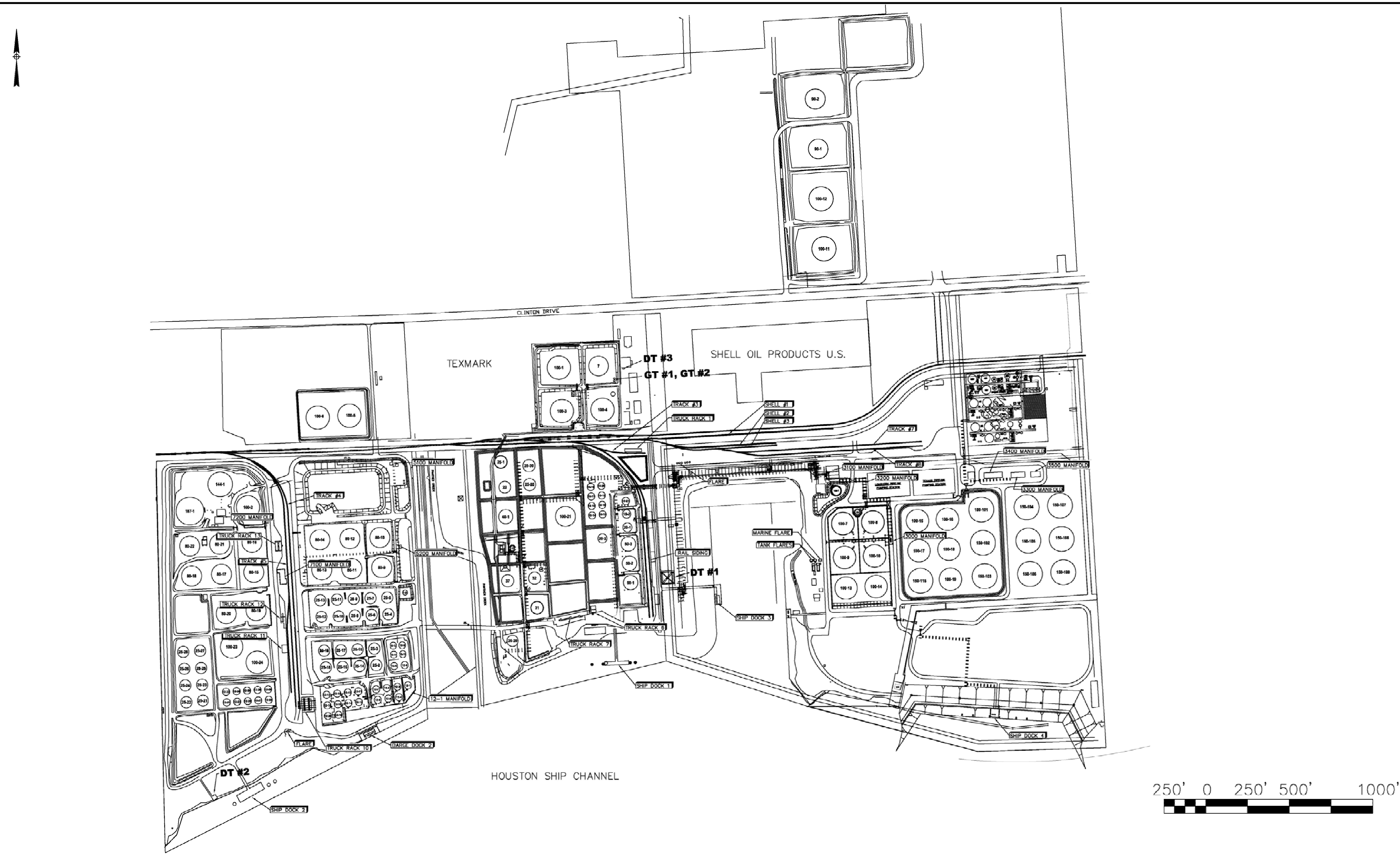
QUADRANGLE LOCATION

KINDER MORGAN
LIQUIDS TERMINALS, L.P.

PROJ. NO.: Kinder Morgan	DATE: 2/23/06	FILE: KinMor–B05

FIGURE 3-1
AREA MAP
GALENA PARK TERMINAL

RPS
14450 JFK Blvd., Suite 400
Houston, TX 77032



PLOT DATE: Apr 28, 2011-6:50AM

CONTRACTOR BLOCK

NOTES

REV. No.	DESCRIPTION	DATE	DRAWN	CHK'D	APP'D
3	GENERAL UPDATES	6-13-08	JLM	JS	JS
2	RELOCATED TANKS 100-13 AND 100-14	4-27-06	SGM		
1	ADDED TANKS 100-13 AND 100-14	10-29-05	SGM		

DRAWING NUMBER	REFERENCE DRAWING

KINDER MORGAN

DRAWN S. MARTIN
CHECKED
APPROVED PROJ. ENGR.

APPROVED REGIONAL ENGR.

Figure 3-2
Galena Park Terminal Plot Plan

RPS
14450 JFK Blvd. Suite 400
Houston, Tx 77032

CONTRACTOR BLOCK	NOTES

DRAWING NUMBER	REFERENCE DRAWING	REV. No.	DESCRIPTION	DATE	DRAWN	CHK'D	APP'D
		A	ISSUED FOR REVIEW	11-15-11	SGM		

KINDER MORGAN

DRAWN S. MARTIN
CHECKED
APPROVED PROJ. ENGR.
APPROVED REGIONAL ENGR.

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Figure 3-3
Proposed Condensate Splitter Plot Plan

RPS
14450 JFK Blvd. Suite 400
Houston, Tx 77032

Section 4
Emissions Summary

This section contains the completed TCEQ Table 1(a) showing the emissions rates for the facilities included in this application. Detailed emission calculations are presented in Appendix A and B of this application. Both routine and MSS emissions are addressed in this application and the emission calculations for both types are discussed below.

4.1 Routine Emissions

Appendix A provides a summary of the routine emission included in this application from the following facility types:

- Heaters;
- Flare;
- Storage Tanks;
- Fugitives; and
- Marine Vessel and Tank Truck Loading.

4.1.1 Heaters

The new condensate splitter plant will utilize four natural gas fired heaters. Heater emission calculations are included in Appendix A as Table A-1. Emission estimates for routine operations assume the maximum firing rate to determine hourly emissions and an annual average firing rate to determine annual emissions. Emission factors for SO_2, VOC, and PM/PM_{10} were taken from AP-42 Section 1.4, Table 1.4-2. The factors were converted to units of lb/MMBtu by dividing by 1,020 as described in footnote (a) of Table 1.4-2.

The heaters will be equipped with ultra-Low NO_X burners and selective catalytic reduction (SCR) controls to reduce NO_X emissions. The annual heater NO_x cap was calculated assuming continuous operation at typical firing rates and an emission factor of 0.01 lb/MMBtu. Although the annual heater NO_x cap is based on 0.01 lb/MMBtu, this low level is not necessarily expected to be achieved by individual combustion units on an annual basis because of degradation during the life of the SCR catalyst. KMLT only represents that the sum of the emissions from the combustion units will comply with the annual cap based on management of heater operating rates and catalyst replacement frequencies. Individual short-term NO_x emissions for the heaters were based on 0.025 lb/MMBtu to allow for short-term fluctuations. Ammonia (NH_3) emissions occur due to slip of excess ammonia from the SCR system. The proposed emission rates are based on an outlet concentration of 10 ppmvd at 3% O_2 from the furnace stacks.

Individual short term CO emissions for the heaters were calculated based on an emission factor equivalent to a concentration of 400 ppmv at 3% O_2. The annual heater CO cap was calculated assuming continuous operation at typical firing rates with an emission factor equivalent to 50 ppmv at 3% O_2. Although the annual heater CO cap is based on this emission factor, this low level is not necessarily expected to be achieved by individual combustion units on an annual basis because of typical variations in operating conditions. KMLT only represents that the sum of the emissions from the combustion units will comply with the annual cap based on management of heater operating rates and good combustion practices.

Individual short-term and annual $PM_{2.5}$ emissions for the heaters were calculated based on an emission factor of 0.005 lbs/MMbtu, which was obtained from performance testing of similar sized units.

4.1.2 Flare

The flare is designed for control of routine venting as well as for use during MSS and upset situations. Flare emissions are summarized on Table A-2. Emissions associated with anticipated MSS activities controlled via the facility flare are discussed in Section 4.2.2.

Normal flaring operations controlling streams from vents can be classified into three main types of activities: fugitive-like sources such as "leak-by" from safety relief and pressure control valves that are closed during routine operation (i.e., process equipment, pressurized storage tanks, etc.), maintenance activities, and process adjustments to maintain product quality. The VOC emissions are based on an assumed destruction efficiency of 99% for compounds containing no more than three carbons that contain no elements other than carbon and hydrogen and 98% for all other compounds.

The total heat input from each stream was determined based on the mass flow, the stream speciation, and the lower heating value of each stream component. The controlled streams are expected to have a combined heating value between 300 and 1,000 Btu/scf; however there may be times when the Btu content is greater than 1,000 Btu/scf. CO and NO_x emissions are based on the highest of the high or low Btu factors for "other flares" from TCEQ's *Technical Guidance Package for Chemical Sources: Flares and Vapor Oxidizers, October 2000*. The H_2S emissions are based on a destruction efficiency of 98% and the SO_2 emissions were estimated based on the assumption that 100% by weight of H_2S is converted to SO_2.

4.1.3 Storage Tanks

Tables A-3 through A-5 summarize emissions from storage tanks. The proposed project includes ten internal floating roof (IRF), seven fixed roof (FXD), and seven pressurized (PRS) storage tanks. Per the TCEQ's *Technical Guidance Package for Chemical Sources: Storage Tanks, February 2001,* storage tank working and breathing emissions were estimated using EPA's *Tanks 4.0* Computer Program, which is based on the emission calculation methods in AP-42 Section 7.

The short-term emission calculation for IFR storage tanks is determined using the following equation:

$$Q_{MAX} = PR_M \times 8760$$

where:

Q_{MAX} = maximum throughput, bbls/year

PR_M = maximum pumping rate (higher of the maximum fill rate or the maximum withdrawal rate, bbl/hr

Q_{MAX} was then used in AP-42 Section 7 emission calculations to determine total annual emissions at the maximum liquid surface temperature. The total calculated annual emissions are then divided by 8,760 hours to get the short-term emission rate.

The short-term emission calculation for the FXD storage tanks is determined by using the following equation:

$$L_{MAX} = L_W * F_{RM} / (N * T_{CG})$$

Where:

L_{max} = Maximum hourly emissions (lb/hr)

L_w = working loss calculated using AP-42, Chapter 12 at maximum liquid surface temperature, lbs/yr (Note: units are lbs/yr not lbs/hr. L_W must be calculated using a turnover factor, K_N, of 1).

FR_m = Maximum fill rate, gal/hr

N = Number of turnovers

T_{CG} = Tank capacity, gallons

The PRS storage tanks included in this application operating pressures are sufficient at all times to prevent vapor or gas loss to the atmosphere. Also note that the PRS storage tanks are routed to the facility flare header; therefore, any emissions from the storage tanks will be controlled.

4.1.4 Fugitives

Table A-6 summarizes emissions from fugitives. Fugitive emission rates of VOC from piping components and ancillary equipment were estimated using the methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives, October 2000.*

Each fugitive component was classified first by equipment type (i.e., valve, pump, relief valve, etc.) and then by material type (i.e., gas/vapor, light liquid, heavy liquid). An uncontrolled VOC emission rate was obtained by multiplying the number of fugitive components of a particular equipment/material type by an appropriate emission factor. Synthetic Organic Chemical Manufacturing Industry (SOCMI) without ethylene factors were used to estimate emissions from the proposed components as the streams have an ethylene content of <11%.

To obtain controlled fugitive emission rates, the uncontrolled rates were multiplied by a control factor, which was determined by the leak detection and repair (LDAR) program employed. KMLT will implement an enhanced 28LAER LDAR program for fugitive components associated with the proposed condensate splitter plant.

4.1.5 Marine Vessel and Tank Truck Loading

Tables A-7 through A-8 summarize emissions from marine vessel loading operations. Loading emissions were calculated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources: Loading Operations (October 2000)* using the following equation from AP-42 "Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources":

$$L = 12.46 * S * P * M/T$$

where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lbmole)
T = Temperature of bulk liquid loaded (R)

The loading emission estimates were based on the physical property data of the material loaded and the actual loading method used. The controlled emissions for products with a vapor pressure > 0.5 psia utilize a vapor collection system that is routed to a control device with a minimum destruction efficiency of 99%. Emissions from the loading emission control devices were estimated using the methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers, October 2002*. VOC emissions are based on a vendor guaranteed destruction efficiency of at least 99%. NO_x and CO emissions were based an estimated loading vapor heat content of 20,000 Btu/lb and on emission factors for high Btu air assisted flares.

Liquids with vapor pressures above atmospheric pressure will be vapor balanced loaded into pressurized tank trucks with no venting to the atmosphere. The loading of such liquids in such pressurized tank trucks is possible because the material in the tank can evaporate or condense as liquid levels change to accommodate liquid level changes without venting.

4.2 Maintenance, Startup, and Shutdown Emissions

This application only addresses the maintenance, startup, and shutdown (MSS) emissions associated with the facilities included in this application. Table B-1 in Appendix B provides a summary of the MSS emissions included in this application. MSS emissions are estimated for the following source types:

- Heaters;
- MSS Vapor Control;
- Storage Tanks;
- Process Equipment and Piping;
- Air Mover and Vacuum Truck; and
- Frac Tanks.

4.2.1 Heaters

Table B-2 summarizes MSS emissions associated with heater startup activities when the SCRs are not operational for a period of up to 168 hours per year per heater due to safety concerns. Emission factors for SO_2, VOC, and $PM/PM_{10}/PM_{2.5}$ were taken from AP-42 Section 1.4, Table 1.4-2. The factors were converted to units of lb/MMBtu by dividing by 1,020 as described in footnote (a) of Table 1.4-2. For start-ups, the CO emissions were based on a concentration of 400 ppmv, and the NO_x emissions were based on 0.065 lb/MMBtu (burners alone, no SCR). During start-up, NOx, SO_2, CO, VOC, and $PM/PM_{10}/PM_{2.5}$ emissions were determined using the heat input from natural gas used during the startup.

4.2.2 MSS Vapor Control

Tables B-3, B-5, B-8, and B-10 summarize controlled MSS emissions associated with entire process unit turnarounds, storage tanks, process equipment, piping, air movers, vacuum trucks, and frac tanks. The controlled MSS emissions described in Sections 4.3, 4.4, 4.5, and 4.6. will be collected via vapor recovery equipment and routed to either the facility flare or portable control devices provided by contractors. Emissions from the facility flare and portable thermal control devices were estimated using the methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers, October 2002.* VOC emissions are based on a vendor guaranteed destruction efficiency of at least 98%. The controlled streams are expected to have a combined heating value between 300 and 1,000 Btu/scf; however there may be times when the Btu content is greater than 1,000 Btu/scf. CO and NO_x emissions are based on the highest of the high or low Btu factors for "other flares" from the previously mentioned TCEQ's Guidance Document. The H_2S emissions are based on a destruction efficiency of 98% and the SO_2 emissions were estimated based on the assumption that 100% by weight of H_2S is converted to SO_2. In addition to portable thermal vapor control, KMLT also proposes to utilize alternate portable control options (i.e., carbon, scrubber, etc.) and manage the controlled emissions to the proposed MSS emissions cap.

4.2.3 Storage Tanks

Tables B-4 and B-5 summarize the controlled MSS emissions (i.e., standing idle, refilling, and degassing) and Table B-6 summarizes the uncontrolled MSS emissions (i.e., venting at 5,000 ppm) associated with storage tank MSS activities. Storage tank floating roof landing emissions were estimated using the methods in Subsection 7.1.3.2.2 Roof Landings of Section 7.1 Organic Liquid Storage Tanks of *Compilation of Air Pollutant Emission Factors: Volume 1 Stationary Point and Area Sources* (AP-42, Fifth Edition, US EPA, November 2006 (hereafter referred to in this application as AP-42).

Landing losses occur from floating roof tanks whenever the tank is drained to a level where its roof lands on its legs or other supports. When a floating roof lands on its supports or legs while the tank is being drained, the floating roof remains at the same height while the product level continues to lower. This creates a vapor space underneath the roof. Liquid remaining in the bottom of the tank provides a continuous source of vapors to replace those expelled by breathing (in the case of internal floating roof tanks) or wind action (in the case of external floating roof tanks). These emissions, referred to as *standing idle losses (L_{SL})*, occur daily as long as the floating roof remains landed.

Additional emissions occur when incoming stock liquid fills a tank with a landed roof. The incoming volume of liquid not only displaces an equivalent volume of vapors from below the floating roof, but also generates its own set of product vapors that are displaced during the filling process. These two types of emissions are collectively referred to as *filling losses (L_{FL})*.

For a given roof landing event, total landing loss emissions are therefore the sum of the filling losses and the daily standing idle losses over the entire period that the roof remained landed. Landing losses are inherently episodic in nature and must be determined each time a tank's floating roof is landed.

Tank design considerations will impact both standing idle and filling loss emissions. Therefore, AP-42 separates floating roof tanks into the following three categories for emissions determination purposes:

- Internal floating roof tanks (IFRTs) with a full or partial heel;
- External floating roof tanks (EFRTs) with a full or partial heel; and
- IFRTs and EFRTs that drain dry.

AP-42 presents standing idle and filling loss equations for each different tank category listed above.

For a given tank, standing idle and filling loss equations from AP-42 are used to determine the emissions for each roof landing event. The annual landing loss emissions can then be determined by summing the emissions from each episode that occurs within a given calendar year. Emissions from each roof landing episode can be individually determined using accurate temperature data and stored liquid properties for the time of year when the roof landing event occurred.

Common data to all emission calculations are the physical tank parameters, meteorological data, and the physical properties of the materials being stored. Meteorological data was taken from the Tanks 4.0 database. The calculation methodology used for the standing loss and refilling emissions is discussed in further detail below.

Similar to breathing losses under normal operating conditions, standing idle losses occur during that period of time a roof is landed with product still in the tank. Emission calculation equations for these losses are from AP-42. The quantity of emissions is dependent upon the number of days idle, tank type (IFR/EFR), type of product stored, and time of year.

For IFR tanks with a liquid heel, standing losses [lbs] are calculated using Equation 2-16 from AP-42:

$$L_{SL} = n_d K_e (PV_v / RT) M_v K_s \, ,$$

where,

n_d= number of days standing idle,

K_e= vapor space expansion factor,

P= true vapor pressure of stock liquid [psia],

V_V = volume of vapor space below landed roof [ft^3],

$= \pi(D/2)^2 h_V = \pi(D/2)^2(h_{ld} - h_{le})$

h_V = height of the vapor space under the floating roof [feet],

h_{ld} = height of the landed roof [feet]

h_{le} = effective height of the stock liquid [feet],

R = ideal gas constant [10.731 psia ft^3 / lb-mole-°R],

T = average temperature of vapor and liquid below landed floating roof [°R],

M_V = stock vapor molecular weight [lb/lb-mole], and

K_s= standing idle saturation factor.

The standing losses cannot physically exceed the available stock liquid in the tank. Therefore, an upper limit to the standing losses [lbs] is provided in Equation 2-13 from AP-42:

$$L_{SL\max} \leq 5.9 D^2 h_{le} W_l \, ,$$

where,

D = tank diameter [feet],

h_{le} = effective height of the stock liquid [feet], and

W_l = stock liquid density [lb/gal].

Maximum hourly VOC emissions for tanks with idle standing losses were determined by calculating the losses for one day and then dividing by twelve hours/day. Twelve hours were used since the tanks breathe out for twelve hours/day and breathe in the other twelve hours.

Maximum annual emissions were based on one landing per tank per year. It was assumed that the tank could stand idle for up to three days, therefore standing idle emissions were estimated assuming a full liquid heel.

Similar to loading losses, refilling losses occur while a tank is being filled with product during that period of time a roof is landed. Emission calculation equations for these losses are from AP-42. The quantity of emissions is dependent upon the tank type (IFR/EFR), type of product stored, time of year, and fill rate.

The maximum refilling loss is based on: (1) the tank re-fill rate; and (2) the month resulting in the highest emissions as a function of vapor pressure.

The refilling emissions from IFR tanks with a liquid heel and tanks that are drained dry are based on the following calculation from Equation 2-26 from AP-42:

$$L_{FL} = (PV_v / RT)M_V S ,$$

where,

P = true vapor pressure of stock liquid (at T_{LA}) [psia],

V_V = volume of vapor space [ft^3],

R = ideal gas constant [10.731 psia ft^3 / lb-mole-°R],

T = average temperature of vapor and liquid below landed floating roof [°R],

= daily average liquid surface temperature, T_{LA},

M_V = stock vapor molecular weight [lb/lb-mole], and

S = filling saturation factor (0.6 for full heel, 0.5 for partial heel, and 0.15 for drain-dry)

Maximum hourly VOC emissions for IFR tanks undergoing a filling operation occur when the tank filling operation begins with the tank containing a full heel of liquid. Maximum hourly VOC emissions were determined by dividing the filling emissions (L_{FL}) by the maximum pumping rate. The calculation assumes that the product vapors within the vapor space under the tank roof are emitted from the tank at the same rate as the liquid coming into the tank. Maximum annual emissions were based on one landing per tank per year.

The roof landing emissions from products with a vapor pressure > 0.5 psia will be collected via vapor recovery equipment and routed to a portable thermal control device. Emissions from the control device were estimated using the methods outlined Section 4.2.2.

When the storage tanks (i.e., IFR, FXD, and PRS) included in this application store liquids with a vapor pressure > 0.5 psia and degassing is required, KMLT proposes to control the resulting vapors in a manner consistent with good engineering practice and in accordance with the VOC degassing regulations specified in 30 TAC §115.541-549. There are two components to the emissions during a tank degassing; degassing to a control device and venting the dilute residual VOC to the atmosphere. After the tank is stripped, the vapor space is degassed and the vapors collected and controlled with a system that is at least 98% efficient in reducing VOC emissions.

The first component of the VOC emission estimate is included in the emission calculations described in Sections 4.2.1 and 4.2.2.

The second component of the emission estimate is from venting the tank to atmosphere after it is degassed to a concentration of 5,000 ppmv (as VOC). The second component of the emissions was calculated by assuming that one tank volume at an initial concentration of 5,000 ppmv is vented to the atmosphere.

Calculations were performed for the tank using the vapor space volume calculated from the vapor space diameter and height. Short-term emission rates were calculated based upon the tank landed volume and the vapor flow rates to the control device or atmosphere. Annual emission rates were based on one tank degassing event per tank per year.

4.2.4 Process Equipment and Piping

Tables B-7 and B-8 summarize the controlled and uncontrolled MSS emissions associated with process equipment and piping MSS activities. On occasion, process equipment (i.e., vessels, towers, etc.) and/or piping (i.e., pumps, valves, meters, etc) is degassed in preparation for an MSS and/or inspection activity. There are four components to the emissions associated with process equipment and/or piping MSS activities; depressurizing and degassing, draining residual material, venting to atmosphere, and refilling activities.

The first component of the emissions estimate is from the depressurizing and degassing of equipment and/or piping. Emissions from the depressurizing and degassing of equipment and piping were estimated the Ideal Gas Law. The controlled depressurizing and degassing emissions from equipment and/or piping are described in more detail in Section 4.2.2.

The second component of the emission estimate is from pumping residual material remaining in the equipment and/or piping to a portable tank/container. Residual material remaining in the equipment and/or cleaning agents are drained to portable tanks/containers prior to vessel venting to the atmosphere. These emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

*L = 12.46 * S* P * M / T*

Where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

Note that materials are often transferred from the portable tanks/containers to an air mover, vacuum truck, and/or frac tank upon completion of the draining activity. Emissions associated with the transfer of the materials from the portable tanks/containers to an air mover, vacuum truck, or frac tank are included in Sections 4.2.5 and 4.2.6.

The third component of the emission estimate is from venting the equipment and/or piping to atmosphere after it is degassed (if applicable) to a concentration of 5,000 ppmv (as VOC). The emissions were estimated by assuming that one equipment and/or piping volume at an initial concentration of 5,000 ppmv is vented to the atmosphere.

The forth component of the emissions estimate is from pumping material into equipment and/or piping following the completion of an MSS and/or inspection activity. The emissions from the equipment loading activities are vented to the control devices described in Section 4.2.2. These emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

*L = 12.46 * S* P * M / T*

Where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

4.2.5 Air Mover and Vacuum Truck Activities

Tables B-9 and B-10 summarize the controlled MSS emissions associated with air mover and vacuum truck activities. VOC vapors are displaced as a result of an air mover and/or vacuum truck activity to collect and remove materials from tanks, process equipment, piping, frac tanks, and portable tank/containers. Air mover and vacuum truck emissions are calculated based on the loading method and control device in use. KMLT proposes to utilize air movers and vacuum trucks which apply a vacuum during loading operations. These emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

$$L = 12.46 * S * P * M / T$$

Where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

Short-term emissions were estimated based on a maximum loading capacity while annual emissions were determined based on the project loading throughput. Loading emissions are routed to a control device which may included, but are not limited to, thermal control, carbon control, etc. Emissions controlled via thermal control device are estimated as described above and in Section 4.2.2. It should be noted that emissions controlled via carbon control are estimated based on vapor flow rates and a carbon breakthrough concentration of 100 ppm.

4.2.6 Frac Tanks

Table B-11 summarizes the controlled MSS emissions associated with the use of portable frac tanks. Residual material is drained and/or pumped from tanks, process equipment, piping, portable tanks, portable containers, etc. into frac tanks as part of facility MSS and/or inspection activities. The frac tank working emissions were estimated as described in TCEQ's *Air Permit Technical Guidance for Chemical Sources, Loading Operations, October 2000* using the following equations:

$$L = 12.46 * S * P * M / T$$

Where:

L = Loading Loss (lb/10^3 gal of liquid loaded)
S = Saturation factor
P = True vapor pressure of liquid loaded (psia)
M = Molecular weight of vapors (lb/lb-mol)
T = Temperature of bulk liquid loaded (R)

The frac tank breathing emissions were estimated using EPA's *Tanks 4.0* Computer Program, which is based on the emission calculation methods in AP-42 Section 7. Per the TCEQ's *Technical Guidance Package for Chemical Sources: Storage Tanks, February 2001*, the short-term emission calculations for the frac tanks (i.e., fixed roof tanks) were based on the following equation:

$$L_{MAX} = L_W * F_{RM} / (N * T_{CG})$$

Where:

L_{MAX} = maximum short-term emission rate, lbs/hr

L_W = working loss calculated using AP-42, Chapter 12 at maximum liquid surface temperature, lbs/yr (Note: units are lbs/yr not lbs/hr. L_W must be calculated using a turnover factor, K_N, of 1).

F_{RM} = maximum filling rate, gals/hr

N = number of turnovers per year

T_{CG} = tank capacity, gals

Frac tank emissions will be routed to portable control devices provided by contractors. Controlled emissions are estimated as described above and in Section 4.2.2.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Table 1(a) Emission Point Summary

Permit Number:	TBD	RN Number:	RN100237452	Date:	2/22/2012
Company Name:	KM Liquids Terminals LLC				

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^oF) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
F-101	F-101	Naphtha Splitter Reboiler Train I	CO	38.06	-	-	-	-	-	-	-	-	-	-	-
			NO_x	3.22	-										
			VOC	0.69	-										
			SO_2	0.77	-										
			PM/PM_{10}	0.96	-										
			$PM_{2.5}$	0.64	-										
			NH_3	0.95	-										
F-102	F-102	Combi Tower Reboiler Train I	CO	30.82	-	-	-	-	-	-	-	-	-	-	-
			NO_x	2.61	-										
			VOC	0.56	-										
			SO_2	0.63	-										
			PM/PM_{10}	0.78	-										
			$PM_{2.5}$	0.52	-										
			NH_3	0.77	-										
F-201	F-201	Naphtha Splitter Reboiler Train II	CO	38.06	-	-	-	-	-	-	-	-	-	-	-
			NO_x	3.22	-										
			VOC	0.69	-										
			SO_2	0.77	-										
			PM/PM_{10}	0.96	-										
			$PM_{2.5}$	0.64	-										
			NH_3	0.95	-										

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above	6. Stack Exit Data			7. Fugitives		
										Diameter	Velocity	Temp	Length	Width	Axis
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	Ground (Feet)	(Feet) (A)	(fps) (B)	(^{o}F) (C)	(ft) (A)	(ft) (B)	Degrees (C)
F-202	F-202	Combi Tower Reboiler Train II	CO	30.82	-	-	-	-	-	-	-	-	-	-	-
			NO_x	2.61	-										
			VOC	0.56	-										
			SO_2	0.63	-										
			PM/PM_{10}	0.78	-										
			$PM_{2.5}$	0.52	-										
			NH_3	0.77	-										
HEAT-CAP	HEAT-CAP	Heater Annual Emissions Cap	CO	-	60.34	-	-	-	-	-	-	-	-	-	-
			NO_x	-	9.80										
			VOC	-	8.80										
			SO_2	-	9.80										
			PM/PM_{10}	-	12.17										
			$PM_{2.5}$	-	8.16										
			NH_3	-	12.70										
FL-101	FL-101	Flare No. 101	CO	2.31	2.28	-	-	-	-	-	-	-	-	-	-
			NOx	0.63	0.62										
			VOC	0.80	0.71										
			SO2	0.00	0.00										
200-201	200-201	Tank No. 200-201	VOC	2.28	4.62	-	-	-	-	-	-	-	-	-	-
200-202	200-202	Tank No. 200-202	VOC	2.28	4.62	-	-	-	-	-	-	-	-	-	-
200-203	200-203	Tank No. 200-203	VOC	2.28	4.62	-	-	-	-	-	-	-	-	-	-
100-201	100-201	Tank No. 100-201	VOC	1.10	1.90	-	-	-	-	-	-	-	-	-	-
100-202	100-202	Tank No. 100-202	VOC	1.10	1.90	-	-	-	-	-	-	-	-	-	-
100-209	100-209	Tank No. 100-209	VOC	1.10	1.90	-	-	-	-	-	-	-	-	-	-
100-203	100-203	Tank No. 100-203	VOC	1.10	0.86	-	-	-	-	-	-	-	-	-	-
100-204	100-204	Tank No. 100-204	VOC	1.10	0.86	-	-	-	-	-	-	-	-	-	-
100-210	100-210	Tank No. 100-210	VOC	1.10	0.86	-	-	-	-	-	-	-	-	-	-

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	Above Ground (Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^{o}F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
5-201	5-201	Tank No. 5-21	VOC	1.33	0.99	-	-	-	-	-	-	-	-	-	-
100-205	100-205	Tank No. 100-205	VOC	14.24	2.92	-	-	-	-	-	-	-	-	-	-
100-206	100-206	Tank No. 100-206	VOC	14.24	2.92	-	-	-	-	-	-	-	-	-	-
100-211	100-211	Tank No. 100-211	VOC	14.24	2.92	-	-	-	-	-	-	-	-	-	-
100-207	100-207	Tank No. 100-207	VOC	14.24	3.64	-	-	-	-	-	-	-	-	-	-
100-208	100-208	Tank No. 100-208	VOC	14.24	3.64	-	-	-	-	-	-	-	-	-	-
100-212	100-212	Tank No. 100-212	VOC	14.24	3.64	-	-	-	-	-	-	-	-	-	-
1-201	1-201	Tank No. 1-201	VOC	1.90	0.04	-	-	-	-	-	-	-	-	-	-
FUG	FUG	Process Fugitive Components	VOC	1.77	7.76	-	-	-	-	-	-	-	-	-	-
MAR-LOADFUG	MAR-LOADFUG	Marine Loading Fugitives Emissions Cap	VOC	211.35	44.64	-	-	-	-	-	-	-	-	-	-
MAR-VCU	MAR-VCU	Marine Loading VCU Emissions Cap	CO	13.88	3.76	-	-	-	-	-	-	-	-	-	-
			NOx	10.41	2.82	-	-	-	-	-	-	-	-	-	-
			VOC	34.44	8.34	-	-	-	-	-	-	-	-	-	-
			SO2	0.04	0.01	-	-	-	-	-	-	-	-	-	-
			$PM/PM_{10}/PM_{2.5}$	0.00	0.00	-	-	-	-	-	-	-	-	-	-
MSS	MSS	MSS Emissions	VOC	181.79	3.92	-	-	-	-	-	-	-	-	-	-
			NOx	41.26	2.71										
			CO	170.49	10.59										
			SO_2	2.85	0.14										
			$PM/PM_{10}/PM_{2.5}$	4.59	0.28										

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Table 1(a)-Emission Point Summary - These forms are for use by sources subject to the New Source Review Program and may be revised [ANSRG95A:7026.v3]

Section 5
BACT/LAER Analysis

Per 30 TAC §116.111(a)(2)(C), new or modified facilities must utilize best available control technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility. Each facility is evaluated on a case-by-case basis. Engineering principles and agency experience, concerning the practicality and reasonableness of an emission reduction option, are used in this determination.

Per 30 TAC §116.150(d)(1), a project subject to NNSR must use control technology that achieves LAER. LAER for the planned project applies to VOC and NO_x emissions. The definition of LAER is specified in EPA's guidance document "*New Source Review Workshop Manual (Draft), October 1990*" and 30 TAC §116.12(15) as the most stringent emission limitation derived from either of the following:

- The most stringent emission limitation contained in the implementation plan of any State for such class or category of source; or
- The most stringent emission limitation achieved in practice for such class or category of source.

The BACT and LAER analysis is presented in this section for routine operation and MSS activities.

5.1 Routine Operation

The following emission sources are addressed in the BACT/LAER analysis for routine operation:

- Heaters;
- Flare;
- Storage Tanks;
- Fugitives; and
- Marine Vessel and Tank Truck Loading.

5.1.1 Heaters

A BACT/RACT/LAER Clearinghouse (RBLC) search was conducted to identify emissions controls and control levels for gas fired heaters permitted throughout the United States. The results of the search are included in Appendix C of this application.

5.1.1.1 Nitrogen Oxide Emissions

Each heater will be equipped with low NO_X burners and a selective catalytic reduction system (SCR) to reduce NO_X emissions. These controls will result in a maximum hourly NO_X emission rate of 0.025 lb/MMBtu. Although the heater annual NO_x emissions cap is based on 0.006 lbs/MMBtu, this low level is not expected to be achieved on all combustion units on an annual basis throughout the SCR catalyst life. Accordingly, KMLT is representing that individual combustion units will achieve the higher hourly emission rate of 0.025 lbs/MMBtu. The use of a higher hourly rate is required to account for process variations and is a common practice for similar permitted facilities. This level of control is consistent with other TCEQ BACT decisions for heaters fired with natural gas fuel. The RBLC analysis did not identify any NO_X control technologies more stringent than the proposed combination of low NO_X burners and SCR, and the proposed emission factor is consistent with the associated limits for combustion of natural gas fuel; therefore, the KMLT proposed NO_X controls represent LAER.

5.1.1.2 Ammonia Emissions

Each heater will be equipped with a SCR system that will be operated to limit ammonia (NH_3) slip to 10 ppmvd (hourly and annual basis). This amount of NH_3 slip is consistent with the TCEQ's BACT guidance for SCR systems specified in the *TCEQ Combustion Sources Current Best Available Control Technology (BACT) Guideline-Boilers* webpage. This amount of NH_3 slip is also consistent with the amount documented in the RBLC search for operating combustion sources.

5.1.1.3 Carbon Monoxide Emissions

Carbon monoxide (CO) emissions from gas-fired heaters are the result of incomplete fuel combustion. Operating conditions that can enhance CO formation include low temperature, insufficient residence time, and insufficient oxygen in the combustion zone. Insufficient oxygen can be the result of a low air-to-fuel ratio, inadequate mixing, or both.

With proper combustion technology and design, generation of CO is minimized by maintaining good combustion efficiency in a gas-fired heater. Combustion efficiency in heaters is a function of both design and operation. Proper fuel-to-air ratio and a design that provides the necessary residence time, temperature, and turbulence within the combustion zone ensure good combustion. BACT guidance on the TCEQ website at the time of preparation of this permit applications states that BACT for CO from process heaters and heaters is an exhaust concentration of 50 ppmvd at 3% oxygen, which is equivalent to about 0.035 lb/MMBtu.

An RBLC database search was conducted for heaters with firing rates between 100 and 250 MMBtu/hr that have been permitted in the past 10 years. The results of the search are presented in Appendix C to this application. Good combustion practices and proper design are the only control methods identified in the RBLC database for CO control. Only one heater in the RBLC had a limit of 0.004 lb/MMBtu, and this limit was calculated from data in the database and not stated as a limit; therefore, it could not be confirmed if the calculated limit was accurate. All other heaters in the database have CO limits of 0.033 lb/MMBtu or higher, which is equivalent to the TCEQ BACT guideline of 50 ppmvd at 3% O_2. The proposed CO emission rates for all heaters are based on 50 ppmvd at 3% O_2. This emission limit will be met on an annual average basis. As demonstrated above, this CO level satisfies BACT requirements.

5.1.1.4 Particulate Matter Emissions

Emissions of particulate matter (PM), which include particulate matter less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$), from gas-fired heaters result from inert solids in the fuel and combustion air and from unburned fuel hydrocarbons that agglomerate to form particles that are emitted in the exhaust. $PM/PM_{10}/PM_{2.5}$ emissions from gas-fired heaters are inherently low because such heaters achieve high combustion efficiencies and usually burn clean fuels. TCEQ does not specify a BACT guideline for PM emissions from gas- fired heaters. The RBLC database search identifies many gas fired heaters and only lists good combustion and use of clean fuels as a control strategy. Since no other controls are available for gaseous fuel combustion, efficient combustion of clean natural gas fuel is proposed as BACT.

5.1.1.5 Sulfur Dioxide Emissions

SO_2 is formed from combusting sulfur containing fuels. The amount of SO_2 emissions is directly proportional to the sulfur content of the fuel. The inherently low sulfur content in pipeline specification natural gas results in limited formation of SO_2 emissions, and represents BACT.

5.1.1.6 Volatile Organic Compound Emissions

VOC emissions from gas-fired heaters are the result of incomplete fuel combustion. Similar to CO, operating conditions that enhance VOC formation include low temperature, insufficient residence time, and insufficient oxygen in the combustion zone. Insufficient oxygen can be the result of a low air-to-fuel ratio, inadequate mixing, or both.

With proper combustion technology and design, the incomplete combustion of VOC is minimized by maintaining good combustion efficiency. Combustion efficiency in heaters is a function of both design and operation. Proper fuel-to-air ratio and a design that provides the necessary residence time, temperature, and turbulence within the combustion zone ensure good combustion. TCEQ does not specify a BACT/LAER guideline for VOC emissions from combustion sources. The RBLC database search identified many gas fired heaters and only lists proper design and good combustion practices as a control strategy. Since no other controls are available, efficient combustion is proposed as LAER for heater VOC emissions.

5.1.2 Flares

A flare is the only technically feasible control option for routine and intermittent process vent streams, as demonstrated by long-term industry practice. The flare will be designed and operated consistent with the TCEQ's BACT guidance as documented on its website (http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/bact/bact_flares.pdf), which specifies that all flares must comply with the requirements in NSPS, Subpart A, Section 60.18 (40 CFR §60.18).

The flare will be:

- Designed to maintain the maximum tip velocity and heating value requirements in 40 CFR §60.18 to ensure flame stability and sufficient destruction efficiency;
- Equipped with a continuously burning pilot;
- Equipped with a pilot monitoring system and an automatic re-ignition system;

- Equipped with a remote infrared flame monitor to ensure flame integrity;
- Equipped with a liquid knockout drum to remove any water and condensables from the gas stream prior to flaring; and
- Designed for smokeless operation.

The flare will result in emissions of CO, NO_x, VOC, and SO_2. BACT or LAER, as applicable, for each of these pollutants is addressed below. An RBLC database search for flare controls was conducted and is summarized in Appendix C of this application.

5.1.2.1 Nitrogen Oxide Emissions

NO_x emissions from the flare are the result of thermal NO_x formation due to elemental nitrogen in the air. The flared gas streams will not contain any significant nitrogen compounds other than elemental nitrogen; therefore, no "fuel NO_x" will be produced. As with CO, NO_x emissions will be minimized primarily by minimizing the amount of flaring to the extent possible.

The above practices are the only available options for controlling NO_x emissions from flaring. As such, KMLT will employ these design and operating measures for the proposed flare to satisfy the LAER requirement.

5.1.2.2 Carbon Monoxide Emissions

CO will be the primary pollutant emitted by the flare as CO is produced from incomplete combustion of carbon compounds. KMLT proposes to minimize CO emissions through the use of a well-designed elevated flare capable of achieving a high VOC destruction efficiency that will also ensure CO production is minimized. The RBLC database search results show no control strategies for minimizing CO from flares other than proper flare design and operation, and operating the flare in accordance with 40 CFR §60.18.

KMLT will maintain the flame integrity through the implementation of good combustion practices and flame detection monitoring with an automatic re-ignition system and designing and operating the flare in accordance with 40 CFR §60.18. Since the combustion efficiency (i.e., destruction/removal efficiency) of a flare is primarily influenced by temperature, residence time, and the mixing of air and process gases in the combustion zone, implementation of these design considerations and use of a natural gas pilot flame will support a flare design that maximizes efficiency and minimizes incomplete combustion. These design requirements satisfy BACT.

5.1.2.3 Sulfur Dioxide Emissions

The flare converts sulfur compounds in the waste gas streams to SO_2; therefore, proper operation of the flare inherently results in SO_2 emissions due to the intended destruction of the reduced sulfur compounds. This destruction efficiency will be met by operating the flare in accordance with the specifications for flares in 40 CFR §60.18 as described previously. These design and operating methods satisfy BACT for SO_2.

5.1.2.4 Volatile Organic Compound Emissions

VOC emissions from the flare are the result of incomplete combustion of VOC compounds in the flared gas streams. The RBLC database search results show no control for VOC from flares other than proper design and operation of the flare as already described. VOC emissions will also be minimized by minimizing the amount of flaring to the extent possible.

As previously stated, the flare will be designed and operated consistent with the TCEQ's BACT guidance as outlined its website and should achieve a minimum destruction efficiency of 98%. Because the above practices are the only available options for controlling VOC emissions from flaring, they represent LAER as well as BACT. As such, KMLT will employ all of these design and operating measures to satisfy the LAER requirement.

5.1.3 Storage Tanks

Volatile organic liquids with vapor pressures less than 11 psia at ambient temperatures are typically stored in fixed or floating roof tanks. Liquids with low volatility (or low vapor pressures) of 0.5 psia or less are typically stored in fixed roof tanks and higher volatility liquids are typically stored in floating roof tanks. These tanks can emit VOC emissions; therefore, LAER is applicable.

5.1.3.1 Low Vapor Pressure Liquids

KMLT proposes to store kerosene, diesel fuel, and resid, which are liquids with VOC vapor pressures considerably less than 0.5 psia, in fixed roof tanks. LAER for low volatility liquids was identified through a RBLC search; a review of applicable federal control requirements, such as those specified in 40 CFR Part 60, New Source Performance Standards (NSPS), and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories; TCEQ regulations; TCEQ permitting guidance; and recent TCEQ LAER determinations. The data obtained through these searches was combined and then sorted to identify LAER candidates, which are presented in Appendix C of this application. The LAER analysis indicates that low volatility liquids are stored in either vertical or horizontal fixed roof tanks. Therefore, KMLT's proposed controls for these tanks meet or exceed LAER requirements.

5.1.3.2 High Vapor Pressure Liquids

KMLT proposes to store high vapor pressure liquids with vapor pressures below atmospheric pressure in cable suspended floating roof tanks. Since storage tank emission rates cannot be verified through continuous emission monitoring or performance testing, potential LAER candidates were ranked based on control technology effectiveness. LAER candidates were identified through a search of EPA's RACT/BACT/LAER Clearinghouse (RBLC); a review of applicable federal control requirements, such as those specified in 40 CFR Part 60, New Source Performance Standards (NSPS), and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories; TCEQ permitting guidance; and recent TCEQ LAER determinations. The data obtained through these searches was combined and then sorted to identify LAER candidates for high vapor pressure liquid storage, which are presented in Appendix C of this application.

Several LAER candidates for routine tank operation were identified. All are technically proven based on their long history of industrial use and include the following, listed from most to least effective:

- Fixed roof or pressurized tank routed through a closed vent system (CVS) to a control device;
- Internal floating roof (IFR) tank with secondary seal system;
- External floating roof (EFR) tank with secondary seal system; and
- Fixed roof tank with vapor balance system.

Fixed roof tanks storing high vapor pressure liquids require a CVS to capture hydrocarbon vapors and route them to a separate control device, such as a flare or carbon absorption system. Some of the stored hydrocarbons escape a tank CVS and are emitted, while another portion of the tank vapors enter the atmosphere due to incomplete control by the abatement device (i.e. unabsorbed emissions from a carbon system and uncombusted organic emissions from a flare or thermal oxidizer). Combustion controls require supplemental fuel and introduce new NO_x, CO, SO_2, and PM emissions and additional VOC emissions from both fuel and tank vapors that would not otherwise have been emitted. In addition, combustion controls are not desirable for high vapor pressure liquid storage tanks because of potential fire and safety concerns. Spent carbon canisters require periodic regeneration. Unless there is a capture system and readily available storage for the VOC after regeneration, even the captured tank vapor ends as an air emission. For the safety and emission concerns listed above, fixed roof tanks routed to control were eliminated from further consideration.

Pressurized tanks can be used for volatile organic liquid storage; however, standard industry practice does not include the use of pressurized tanks for the proposed level of high vapor pressure liquid storage. If pressurized tanks are not allowed to vent freely, the vapors within the tank could accumulate to within the explosive range; thereby, posing a potential safety hazard. Pressurized tanks can be designed to vent to flare; however, the same issues identified above for fixed roof tanks vented to flare also apply here. In light of the potential safety issues, pressurized tanks were eliminated from further consideration.

IFR tank controls consist of a fixed roof over an EFR tank configuration. For BACT purposes, IFR and EFR tanks are generally considered equivalent. However, an IFR tank with identical seals and fittings as an EFR tank will have lower emissions and, therefore, is considered the more stringent control for LAER purposes. A fixed roof tank with vapor balancing would only control tank filling/working losses and provides no control of normal breathing losses. A fixed roof tank represents an uncontrolled scenario for volatile organic liquid service, such as with high vapor pressure products. Since the IFR tank provides more emission control than either the fixed roof tank with vapor balance or an EFR tank, both of these control systems were eliminated from further consideration.

IFR tanks have a well-established history of use in high vapor pressure liquid service. The effectiveness of an IFR control system is optimized by minimizing the potential pathways for evaporative losses. For example, emission potential is reduced by using dual seals instead of a single seal, a cable suspended roof rather than a leg supported roof, a self supporting exterior roof versus a column supported roof, welded decks instead of bolted decks, and, to the extent practicable, gasketed fittings instead of ungasketed fittings. It is important to note that fitting selection is not based strictly on reducing emission potential. Fittings are needed to accommodate structural support and for operational and inspection purposes, and will vary depending on the specific tank application. A review of the controls listed in Appendix C shows that LAER for high vapor pressure liquid storage tanks has consistently been the use of an IFR tank with welded decks and dual seal systems. Based on the foregoing, KMLT proposes the use of cable suspended floating roof storage tanks with welded decks and secondary seal systems to meet LAER for high vapor pressure liquid service.

5.1.3.3 Liquids with Vapor Pressures Above Atmospheric Pressure

KMLT proposes to store Y-Grade products, which have vapor pressures above atmospheric pressure in pressurized storage tanks with no vent to the atmosphere. Storage of such liquids in such pressurized storage tanks is possible because the material in the tank can evaporate or condense as liquid levels change to accommodate liquid level changes without venting. There are no routine emissions from such tanks, so use of these tanks for materials with vapor pressures above atmospheric pressure is appropriate LAER control for VOC.

5.1.4 Fugitives

Fugitive emissions from leaking process equipment will result in emissions of VOC. The RBLC database was searched for process fugitives of all pollutants. Searches were performed for the petroleum refining and SOCMI industries as these two industrial categories contained equipment leak subcategories in the database search options. The data was combined and then sorted by pollutant and is presented in Appendix C of this application. No control technology other than leak detection and repair (LDAR) was listed in the database.

Control of fugitive emissions from equipment components is accomplished through a combination of equipment design to minimize emissions and work practices, typically referred to as LDAR programs. LDAR programs are the primary established method of fugitive emission control. The goal of an LDAR program is to minimize VOC emissions from piping components in gas or liquid service through frequent inspections of the piping components to identify leaks early and before they become problematic. Leak detection can be accomplished through the use of special sensors designed specifically to detect vapors as well as by visual, audio, and olfactory cues. Once a leak is identified, LDAR programs require a specific regimen for repairing the leak and ensuring that the repair adequately fixed the leak.

All LDAR programs can be defined by four primary criteria:

- Vapor Pressure/Concentration Threshold for VOC Streams to Monitor
- Monitoring Frequency,
- Leak Definition, and
- Requirements for Repair

The first criterion is the vapor pressure or concentration threshold for instrument monitoring. For a given component servicing a VOC stream, if the vapor pressure or pollutant concentration of the stream is below the threshold, it does not require instrument monitoring. The basis for this is that instrument assisted monitoring of low concentration streams can be ineffective, and largely depends on the definition of a leak. Higher leak definition concentrations equate to a higher concentration threshold for instrument monitoring. However, audio, visual, and olfactory (AVO) inspections of heavy liquid streams excluded from instrument monitoring can be effective tools to minimize emissions from these sources.

The second criterion of an LDAR program is to establish a monitoring frequency. LDAR programs typically prescribe instrument monitoring frequencies ranging from monthly to annually.

The third criterion is the definition of a leak. The leak definition is the monitored concentration that identifies a leaking component needing repair. For example, if a component is monitored at 450 ppmv, but the leak definition is 2,000 ppmv, it is not considered leaking. LDAR programs typically prescribe leak definitions ranging from 500 ppmv up to 10,000 ppmv.

The final criterion of an LDAR program is to establish the requirements for repairing a leaking component. The repair requirements for LDAR programs can be broken down into two main categories: directed and non-directed maintenance. Directed maintenance requires instrument monitoring to be used in conjunction with the repair. The instrument monitoring is used to validate that the repair has fixed the leaking component. Non-directed maintenance does not require instrument monitoring when repairs to leaking components are made.

Equipment design, another element of fugitive emissions control, is generally combined with an LDAR program to further minimize fugitive emissions. For example, use of particular types of seals on pumps and appropriately sized caps are specified as part of most Texas LDAR programs. There are valves designed to operate leakless, such as bellows valves; however, KMLT is not aware of a similar plant that employs leakless valve technologies.

TCEQ has developed protocols for several LDAR programs of varying stringency that address these various criteria. The most stringent program, referred as 28LAER, was developed to satisfy the NNSR LAER requirements. The RBLC database search did not identify any applicable control strategies for VOC processes fugitives more stringent than the TCEQ's

28LAER LDAR program. Therefore, implementation of TCEQ's 28LAER LDAR program is proposed as LAER for VOC process fugitive emissions.

5.1.5 Loading Operations

LAER candidates for loading operations were identified through a search of EPA's RACT/BACT/LAER Clearinghouse (RBLC); the California Air Resource Board's (CARB's) control database; a review of applicable federal control requirements, such as those specified in 40 CFR Part 60, New Source Performance Standards (NSPS), and 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories; TCEQ permitting guidance; and recent TCEQ LAER determinations. The data obtained through these searches was combined and then sorted to identify LAER candidates for tank truck and marine loading, which are presented in Appendix C of this application.

5.1.5.1 Marine Loading

Loading into marine vessels includes both barges and ships. Two LAER candidates for marine loading were identified, both of which are routinely used by industry for the loading of finished and intermediate petroleum products with maximum true vapor pressures of 0.5 psia or more. Both of these candidates are technically viable for barge loading; however, only barges can be equipped with vacuum collection systems as there are safety concerns associated with loading ships under vacuum. Therefore, the only viable control system for ship loading emissions is the second listed option. The control candidates are listed below in order of most to least effective.

- Submerged loading via a vacuum collection system with collected loading losses routed to a control device (for barges only); or
- Submerged loading into tank trucks that are annually leak-tested with collected loading losses routed to a control device (barges and ships).

KMLT proposes to use a vacuum collection system while loading barges that are annually leak-tested. The use of a vacuum collection system while loading barges is expected to achieve a 100% collection of loading losses. No documentation could be found that the 100% collection efficiency has been verified in practice; however, TCEQ routinely accepts this level of control provided all hatches are properly closed and a sufficient vacuum is maintained during the loading operation. Ship loading is expected to achieve a 95% collection of loading losses. The collected emissions from all marine vessels are then routed to a Thermal Oxidizer/Vapor Combustion Unit designed for a minimum VOC destruction efficiency (DRE) of 99%. KMLT proposes to implement the above control system to satisfy the LAER control requirement for loading of liquids with maximum true vapor pressures of 0.5 psia or more.

5.1.5.2 Tank Truck Loading

KMLT proposes to load Y-Grade product, which has a vapor pressure above atmospheric pressure in pressurized tank truck with no vent to the atmosphere. The loading of such liquids in such pressurized tank trucks is possible because the material in the tank can evaporate or condense as liquid levels change to accommodate liquid level changes without venting. There are no routine emissions from such tank trucks, so use of these tank trucks for materials with vapor pressures above atmospheric pressure is appropriate LAER control for VOC.

5.2 MSS Activities

The BACT/LAER analysis addresses the following MSS activities and sources:

- Heaters;
- MSS Vapor Control;
- Storage Tanks;
- Process Equipment and Piping;
- Air Mover and Vacuum Truck; and
- Frac Tanks.

BACT listings were found in the EPA RBLC search for some of the MSS activities listed above. TCEQ has no published BACT or LAER guidelines applicable to the other MSS sources or activities discussed in this application. The LAER candidates for MSS activities are based on the RBLC BACT listings and on past TCEQ permitting actions.

Best Management Practices (BMP) for MSS activities includes the following:

- Minimizing the number and duration of all planned MSS events;

- Beginning tank degassing with 24 hours after the roof has been landed and the tank completely drained;

- Degassing tanks, process equipment, and piping with volumes > 85 ft^3 to a maximum outlet concentration of 5,000 ppmv, measured as VOC, and maintaining that concentration (or less) until maintenance activities are completed or refilling begins;

- Routing the degassed vapors to a control system capable of reducing emissions by 98%, such as a portable flare or internal combustion engine; and

- Managing residual products with vapor pressures > 0.5 psia that are removed from equipment and piping as a result of an MSS activity in a controlled manner. Specifically, KMLT will utilize air movers, vacuum trucks, and frac tanks equipped with vapor controls when handling materials with vapor pressures > 0.5 psia. All frac tanks will be loaded via submerged fill pipes.

Due to the insignificant level of emissions associated with the MSS activities included in this application, KMLT proposes to implement the above described BMP to satisfy the BACT/LAER control requirements.

Section 6
Permit Application Fee

In accordance with 30 TAC §116.141, the permit fee is determined from the capital cost associated with any modifications of existing sources or the installation of any new emission sources. Therefore, based upon the capital cost associated with this permit application, a fee of $75,000 is required. TCEQ Table 30 (Estimated Capital Cost and Fee Verification) is included in this section.

A check is being submitted concurrently with this application to the TCEQ Financial Administration Division for the fee required for this air permit amendment. A copy of the fee check is included in this section.

TCEQ

Texas Commission on Environmental Quality
Table 30
Estimated Capital Cost and Fee Verification

Include estimated cost of the equipment and services that would normally be capitalized according to standard and generally accepted corporate financing and accounting procedures. Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality, Air Permits Division Web site at www.tceq.state.tx.us/nav/permits/air_permits.html.

I. DIRECT COSTS [30 TAC § 116.141(c)(1)]	**Estimated Capital Cost**
A. A process and control equipment not previously owned by the applicant and not currently authorized under this chapter	-
B. Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements	-
C. Freight charges	-
D. Site preparation, including demolition, construction of fences, outdoor lighting, road and parking areas	-
E. Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment	-
F. Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures	-
G. Ambient air monitoring network	-
II. INDIRECT COSTS [30 TAC § 116.141(c)(2)]	**Estimated Capital Cost**
A. Final engineering design and supervision, and administrative overhead	-
B. Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up	-
C. Contractor's fee and overhead	-
TOTAL ESTIMATED CAPITAL COST	>$25,000,000

I certify that the total estimated capital cost of the project as defined in 30 TAC § 116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Company Name: KM Liquids Terminals LLC

Company Representative Name (please print): William P. Brown Title: V.P. Operations

Company Representative Signature: W. P. Brown 2/21/12

Estimated Capital Cost		**Permit Application Fee**	**PSD/Nonattainment Application Fee**
Less than	$300,000	$900 (minimum fee)	$3,000 (minimum fee) $900
$300,000 to	$25,000,000	0.30% of capital cost	1.0% of capital cost
$300,000 to	$7,500,000		$75,000 (maximum fee)
Greater than	$25,000,000	$75,000 (maximum fee)	
Greater than	$7,500,000		

PERMIT APPLICATION FEE (from table above) = $ 75,000 Date: 2/13/2012

Kinder Morgan Operating L.P. "A"

No. 939672

Check Date: 02/13/2012

(100053390)

TEXAS COMMISSION ON ENV QLTY, P.O. BOX 13089, AUSTIN TX 78711-3089

Description	Voucher #	Date	PO Number	Gross Amount	Discount Amount	Net Amount Paid
PMTREQAIRPRECONSTR.FEE ***Return check to Chris Janak - 640F, X39029***	6751780	02/08/12		$75,000.00	$0.00	$75,000.00
			Totals	$75,000.00	$0.00	$75,000.00

Detach at Perforation Before Depositing Check

100053390

KINDER MORGAN

Kinder Morgan Operating L.P. "A"
500 Dallas, Suite 1000
Houston, TX 77002

Wells Fargo Bank Ohio, N.A.
115 Hospital Drive
Van Wert, OH 45891
56-382/412

Check No. 939672

Check Date
02/13/2012

Check Amount
$ ****75,000.00

PAY *Seventy Five Thousand AND 00/100*

TO THE ORDER OF
TEXAS COMMISSION ON ENV QLTY
P.O. BOX 13089
AUSTIN TX 78711-3089

100053390

COPY

⑈0000939672⑈ ⑆041203824⑆96000500016⑈

Section 7
Process Description

The Galena Park Terminal is a for-hire bulk petroleum storage terminal. Petroleum products and specialty chemicals are stored in various storage tanks and transferred in and out of the terminal tankage by external customers via pipeline, tank truck, railcar, and marine vessel. The facility consists of various storage tanks and their associated piping, loading, and control equipment. The proposed condensate splitter to be installed at the Galena Park Terminal, will consist of two trains which will each process 50,000 bbl/day of a hydrocarbon condensate material to obtain products suitable for commercial use. The process described in the following paragraphs utilizes conventional distillation technology.

The hydrocarbon condensate is fed from storage to the stabilizer column where a lighter condensate fraction is distilled from the overhead and a heavier fraction is withdrawn from the bottom of the column. The feed to this stabilizer column is preheated with waste heat recovered from hot product streams to reduce the amount of heat required for distillation. The majority of the heat required is supplied by a direct fired heater which utilizes natural gas as the fuel and exchanges heat with a bottoms recirculating stream from the fractionation column. A bottoms recirculating pump is provided to establish the required flow. An appropriate amount of heat is also recovered from hot products going to storage by heat exchange with an internal column liquid to provide additional heat for distillation. This heat exchange also helps to reduce the amount of heat required from the direct fired heater. The overhead product from the stabilizer column is condensed and is stored in pressurized storage for transfer by truck to offsite facilities for further processing. The bottoms stream from the stabilizer column is transferred to a second coil in the direct fired heater to add preheat before further fractionation in the main fractionation column.

This main fractionation column splits the bottoms from the stabilizer column into four commercially acceptable streams. Two of these streams are taken off as side draws and fed to the top of individual stripping columns. Lighter material is stripped from the product draw in each of these columns by introducing heat to the bottom of each individual column. This is accomplished by recirculating the column bottoms through individual coils in a second fired heater with centrifugal pumps. The stripping vapor is returned to the main fractionation column from the overhead of each column and the stripped bottoms product from each column is used to preheat the feed stock before final cooling and transfer to storage.

In addition to the side draw products, a bottoms product and overhead product are produced from the main fractionation column. These products represent the heaviest fraction and the lightest fraction of the stabilized condensate respectively. Heat is applied to the bottom of the column through a recirculation system that utilizes centrifugal pumps to transfer the total bottom stream to the second fired heater, which is also fueled with natural gas. A portion of the fluid that is re-circulated through this heater is vaporized for heat input to the column. The remaining portion is withdrawn as the heavy product from the column and is used to preheat the feed to the process before final cooling and transfer to storage. The overhead vapor from the main fractionation column is condensed using ambient air. A portion of the resulting liquid is returned to the column to cool the overhead vapor stream. The remaining portion is produced as a light condensate product that is used to heat the feed to the process before final cooling and transfer to storage.

In addition to the main fractionation units just described, there are certain support processes that are required. Among them is an elevated flare that is used in emergency overpressure situation to dispose of excess process vapor. Also note that existing docks will be utilized to transfer products offsite and a new tank truck rack for the Y-Grade product loading will be constructed for product transfer.

Simplified process flow diagrams for the facilities included in this application are included as Figures 7-1 and 7-2.

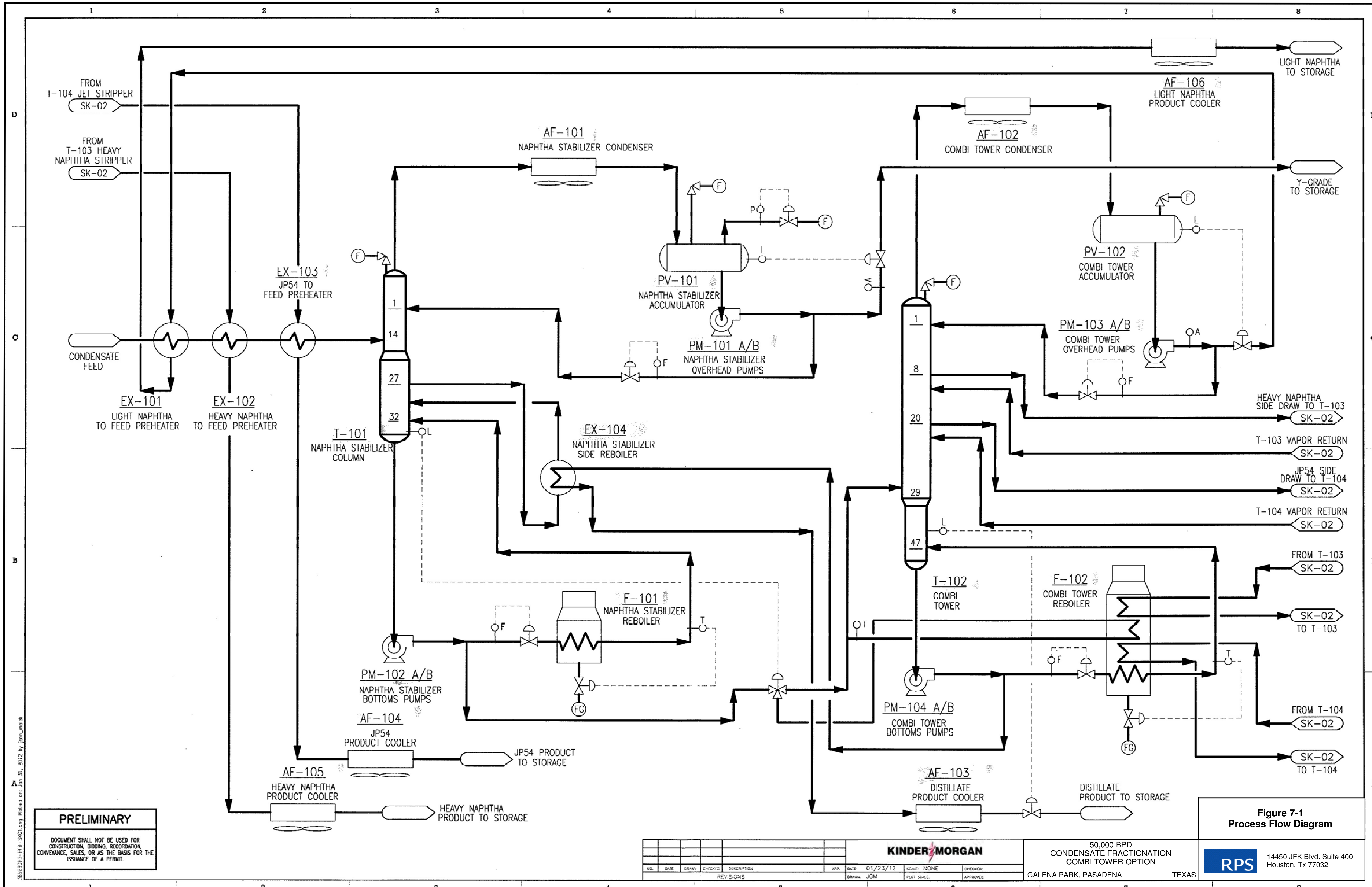
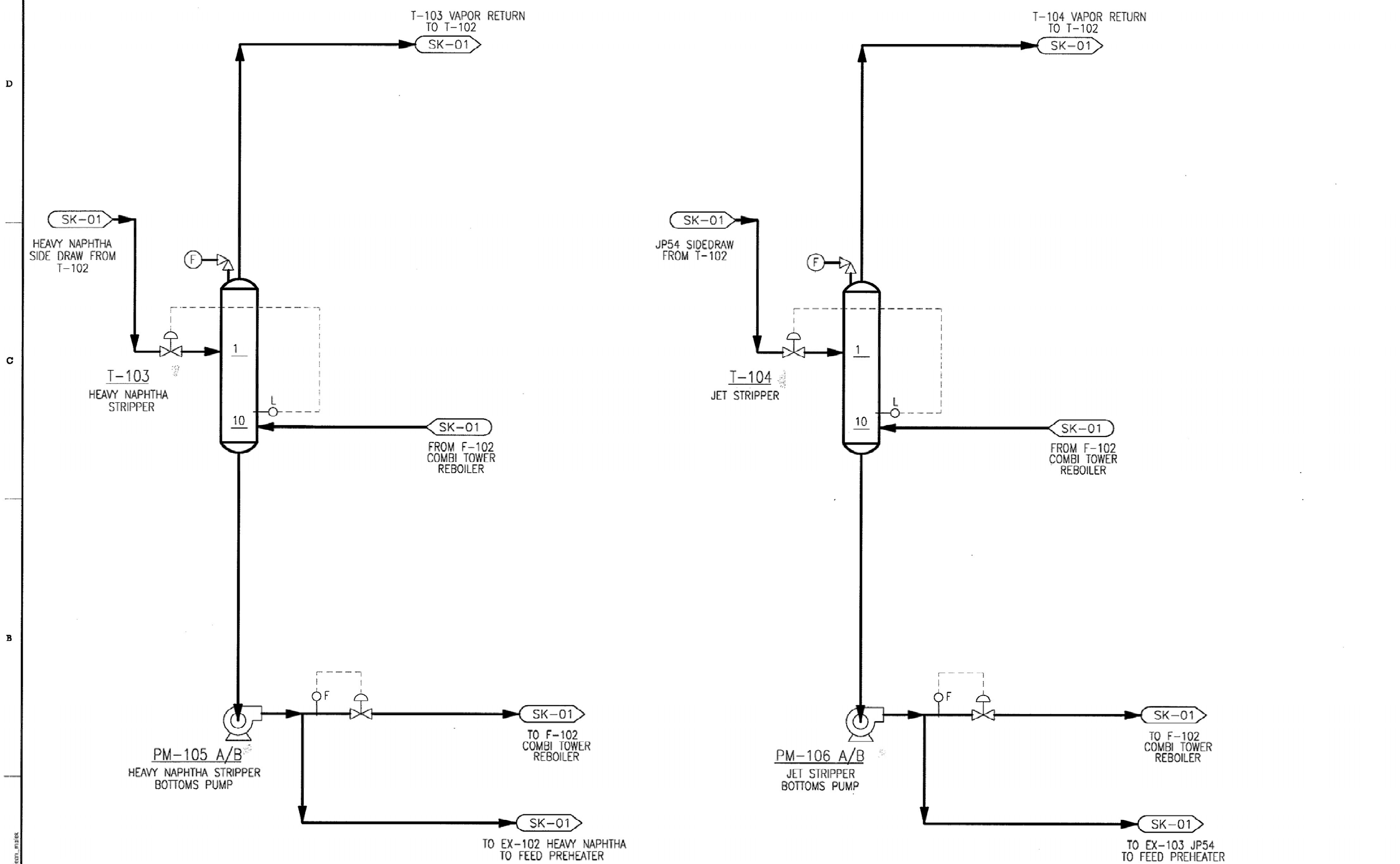


Figure 7-1
Process Flow Diagram



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PRELIMINARY

DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

NO	DATE	DRAWN	CHECKED	DESCRIPTION	APP

REVISIONS

KINDER MORGAN

DATE: 01/23/12 SCALE: NONE CHECKED:
DRAWN: JGM PLOT SCALE: APPROVED:

50,000 BPD
CONDENSATE FRACTIONATION
COMBI TOWER OPTION
GALENA PARK, PASADENA TEXAS

Figure 7-2
Process Flow Diagram

RPS
14450 JFK Blvd. Suite 400
Houston, Tx 77032

Section 8
NNSR and PSD Applicability

Non-attainment New Source Review (NNSR) permitting is required for each non-attainment pollutant for which a modification of an existing major source will result in a significant net emissions increase. Prevention of Significant Deterioration (PSD) permitting is required for a modification of an existing major source for each attainment pollutant and other regulated pollutants (such as H_2S and H_2SO_4) for which the modification will result in a significant net emissions increase. The emission increases associated with this permit application are summarized and compared to the NNSR/PSD applicability thresholds in Table 1-1 at the end of Section 1. Included at the end of this section are the applicable Table 1F, Table 2F, and Table 3F. Harris County is designated non-attainment for the eight-hour and one-hour ozone National Ambient Air Quality Standards (NAAQS) and attainment/unclassified for all other criteria pollutants.

8.1 NNSR Requirements

NNSR applicability is determined on pollutant-specific basis. However, because VOC and NO_x are both regulated as precursors to ozone formation, emission increases of both these pollutants must be evaluated in determining NNSR applicability in ozone non-attainment areas.

The Galena Park Terminal is an existing major source of both VOC and NO_x. The proposed project emissions and the contemporaneous net emission increases for both pollutants are expected to exceed the major modification thresholds. Therefore the proposed project is expected to be subject to the NNSR program for VOC and NO_x. Accordingly, the project will need to satisfy the following requirements of 30 TAC §116.150(d):

(1) *The proposed facility shall comply with the lowest achievable emission rate (LAER) as defined in 30 TAC §116.12.*

See Section 5 for a demonstration that the proposed facility will comply with LAER.

(2) *All major stationary sources owned or operated by the applicant (or by any person controlling, controlled by, or under common control with the applicant) in the state must be in compliance or on a schedule for compliance with all applicable state and federal emission limitations and standards.*

KMLT will work with TCEQ in the course of the review of this permit application to ensure that this requirement is satisfied and documented as appropriate.

(3) *At the time the new or modified facility or facilities commence operation, the emissions increases from the new or modified facilities must be offset using the offset ratio based on the area's nonattainment classification.*

See Section 8.1.1 below for discussion of how the offset requirement will be satisfied.

(4) *The permit application must contain an analysis of alternative sites, sizes, production processes, and control techniques for the proposed source.*

See Section 8.1.2 below for this analysis.

8.1.1 Offset Requirement

KMLT will provide offsets for the project in a ratio of 1.3 to 1.0 prior to the start of operation of the facilities included in this application. A summary of the currently calculated project emissions and the potential offset requirements is included below:

Pollutant	Phase I Project Emissions (tons)	Phase II Project Emissions (tons)	Project Offset Requirement (tons)
NO_x	8.35	7.59	20.73
VOC	71.69	50.33	158.62

This information will be updated in the course of the application review as project emissions are confirmed by TCEQ.

8.1.2 Alternatives Analysis

In accordance with 30 TAC §116.150(d)(4), the following sections contain an analysis of alternative sites, sizes, production processes, and control techniques for the proposed condensate splitter unit.

8.1.2.1 Alternate Site Analysis

KMLT considered several of its existing sites because of the potential to minimize costs by utilizing existing infrastructure. The Galena Park location was selected because the costs of achieving adequate access to raw material, product pipelines, and marine loading access was significantly less for Galena Park as compared to the other potential locations.

8.1.2.2 Alternate Size Analysis

KMLT has determined that there is no emission reduction benefit to scaling down the condensate splitter unit. The capital and operating costs per unit of throughput are significantly reduced by building a condensate splitter unit as large as possible. Additionally, fugitive VOC emissions per unit of throughput are minimized by building a larger condensate splitter unit because the component count is much the same regardless of the size of the unit. Fugitive component emissions do not vary based on pipe size.

8.1.2.3 Alternate Production Process Analysis

The proposed condensate splitter unit was chosen for this project in large part due to recent oil and gas discoveries in areas such as the Barnett Shale and the Eagle Ford Shale which are expected to result in abundant raw material and favorable pricing for many years to come.

8.1.2.4 Control Techniques

Application of LAER control technology for VOC and NO_x assures that these emissions are minimized to the maximum extent demonstrated in practice. As required by 30 TAC §116.150(d)(1), LAER will be applied to each new facility that will emit VOC or NO_x. Section 5 of this permit application includes a detailed discussion of the control technology applied to each facility included in this application. KMLT will provide VOC and NO_x offsets for the project in a ratio of 1.3 to 1.0 prior to the start of operation of the facilities included in this application.

8.2 PSD Requirements

The Galena Park Terminal is currently considered a major source for PSD purposes. Table 1-1 summarizes the currently calculated project emission increases associated with this permit application and compares the increases to the PSD applicability thresholds. As shown in Table 1-1, the NO_2 (NO_x), CO, SO_2, PM/PM_{10}/$PM_{2.5}$ project emission increases are below the significance level so netting is not required; therefore, PSD review is not required.

Application of BACT ensures that emissions of all pollutants are minimized to the extent technically feasible and economically reasonable. Section 5 of this permit application includes a detailed discussion of the control technology applied to each facility included in this application.

The Galena Park Terminal is not located within 100 km of a Class I area, so KMLT has not performed a Class I area impact analysis. An air quality impacts analysis will be conducted to demonstrate that the emissions associated with the proposed project will not cause or contribute to a violation of any applicable NAAQS or PSD increment.

TABLE 1F
AIR QUALITY APPLICATION SUPPLEMENT

Permit No.: TBD	Application Submittal Date: 2/22/2012
Company: KM Liquids Terminals LLC	
RN: 100237452	Facility Location: 906 Clinton Drive
City: Galena Park	County: Harris
Permit Unit I.D.: See permit application	Permit Name: TBD
Permit Activity: ☐ New Source ☒ Modification	
Project or Process Description: Terminal Expansion	

Complete for all Pollutants with a Project Emission Increase.	POLLUTANTS						
	Ozone		CO	PM_{10}	NO_X	SO_2	Other[1]
	VOC	NO_X					
Nonattainment? (yes or no)	Yes	Yes	No	No	No	No	-
Existing site PTE (tpy)?	>25	>25	>100	<100	<100	<100	-
Proposed project emission increases (tpy from 2F)[3]	>5	> 5	<100	<100	<100	NA	-
Is the existing site a major source? [2]If not, is the project a major source by itself? (yes or no)	Yes	Yes	Yes	No	No	No	-
If site is major, is project increase significant?	Yes	Yes	NA	NA	NA	NA	-
If netting required, estimated start of construction? 1/1/2013							
Five years prior to start of construction: 1/1/2008						contemporaneous	
Estimated start of operation: 1/1/2014						period	
Net contemporaneous change, including proposed project, from Table 3F. (tpy)	> 25	> 25	NA	NA	NA	NA	-
FNSR APPLICABLE? (yes or no)	Yes	Yes	No	No	No	No	-

1 Other PSD pollutants.
2 Nonattainment major source is defined in Table 1 in 30 TAC 116.12(11) by pollutant and county. PSD thresholds are found in 40 CFR § 51.166(b)(1).
3 Sum of proposed emissions minus baseline emissions, increases only. Nonattainment thresholds are found in Table 1 in 30 TAC 116.12(11) and PSD thresholds in 40 CFR § 51.166(b)(23).

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

W. P. Brown — V. P. Operations — 2/21/12

Signature — Title — Date

TCEQ - 10154 (Revised 10/08) Table 1F
These forms are for use by facilities subject to air quality permit requirements and may be revised periodically. (APDG 5912v1)

Table 2F - VOC
Project Emission Increase

Pollutant[1]: VOC	Permit No.: TBD
Baseline Period: NA	

	Affected or Modified Facilities[2] FIN	EPN	Permit No.	Actual Emissions[3] (tons/yr)	A Baseline Emissions[4] (tons/yr)	B Proposed Emissions[5] (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A)[6] (tons/yr)	Correction[7] (tons/yr)	Project Increase[8] (tons/yr)
1	F-101	F-101	-	-	-	2.43	-	2.43	-	2.43
2	F-102	F-102	-	-	-	1.97	-	1.97	-	1.97
3	F-201	F-201	-	-	-	2.43	-	2.43	-	2.43
4	F-202	F-202	-	-	-	1.97	-	1.97	-	1.97
5	FL-101	FL-101	-	-	-	0.71	-	0.71	-	0.71
6	200-201	200-201	-	-	-	4.62	-	4.62	-	4.62
7	200-202	200-202	-	-	-	4.62	-	4.62	-	4.62
8	200-203	200-203	-	-	-	4.62	-	4.62	-	4.62
9	100-201	100-201	-	-	-	1.90	-	1.90	-	1.90
10	100-202	100-202	-	-	-	1.90	-	1.90	-	1.90
11	100-209	100-209	-	-	-	1.90	-	1.90	-	1.90
12	100-203	100-203	-	-	-	0.86	-	0.86	-	0.86
13	100-204	100-204	-	-	-	0.86	-	0.86	-	0.86
14	100-210	100-210	-	-	-	0.86	-	0.86	-	0.86
15	5-201	5-201	-	-	-	0.99	-	0.99	-	0.99
16	100-205	100-205	-	-	-	2.92	-	2.92	-	2.92
17	100-206	100-206	-	-	-	2.92	-	2.92	-	2.92
18	100-211	100-211	-	-	-	2.92	-	2.92	-	2.92
19	100-207	100-207	-	-	-	3.64	-	3.64	-	3.64
20	100-208	100-208	-	-	-	3.64	-	3.64	-	3.64
21	100-212	100-212	-	-	-	3.64	-	3.64	-	3.64
22	1-201	1-201	-	-	-	0.04	-	0.04	-	0.04
23	B5-201	B5-201	-	-	-	-	-	-	-	-
24	B5-202	B5-202	-	-	-	-	-	-	-	-
25	B5-203	B5-203	-	-	-	-	-	-	-	-
26	B5-204	B5-204	-	-	-	-	-	-	-	-
27	B5-205	B5-205	-	-	-	-	-	-	-	-
28	B5-206	B5-206	-	-	-	-	-	-	-	-
29	B5-207	B5-207	-	-	-	-	-	-	-	-
30	FUG	FUG	-	-	-	7.76	-	7.76	-	7.76
31	MAR-LOADFUG	MAR-LOADFUG	-	-	-	44.64	-	44.64	-	44.64
32	MAR-VCU	MAR-VCU	-	-	-	8.34	-	8.34	-	8.34
33	MSS	MSS	-	-	-	3.92	-	3.92	-	3.92
26	TNK-TRANS1	TNK-TRANS1	-	-	-	5.00	-	5.00	-	5.00
									Page Subtotal[9]:	*122.01*

Table 2F - NO_x
Project Emission Increase

Pollutant[1]: NO_x	Permit No.: TBD
Baseline Period: NA	

	Affected or Modified Facilities[2] FIN	Affected or Modified Facilities[2] EPN	Permit No.	Actual Emissions[3] (tons/yr)	A Baseline Emissions[4] (tons/yr)	B Proposed Emissions[5] (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A)[6] (tons/yr)	Correction[7] (tons/yr)	Project Increase[8] (tons/yr)
1	F-101	F-101	-	-	-	2.71	-	2.71	-	2.71
2	F-102	F-102	-	-	-	2.19	-	2.19	-	2.19
3	F-201	F-201	-	-	-	2.71	-	2.71	-	2.71
4	F-202	F-202	-	-	-	2.19	-	2.19	-	2.19
5	FL-101	FL-101	-	-	-	0.62	-	0.62	-	0.62
6	MAR-VCU	MAR-VCU	-	-	-	2.82	-	2.82	-	2.82
7	MSS	MSS	-	-	-	2.71	-	2.71	-	2.71
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
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21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
									Page Subtotal[9]:	*15.94*

Notes:

Table 2F - CO
Project Emission Increase

Pollutant[1]: CO	Permit No.: TBD
Baseline Period: NA	

	Affected or Modified Facilities[2] FIN	EPN	Permit No.	Actual Emissions[3] (tons/yr)	A Baseline Emissions[4] (tons/yr)	B Proposed Emissions[5] (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A)[6] (tons/yr)	Correction[7] (tons/yr)	Project Increase[8] (tons/yr)
1	F-101	F-101	-	-	-	16.67	-	16.67	-	16.67
2	F-102	F-102	-	-	-	13.50	-	13.50	-	13.50
3	F-201	F-201	-	-	-	16.67	-	16.67	-	16.67
4	F-202	F-202	-	-	-	13.50	-	13.50	-	13.50
5	FL-101	FL-101	-	-	-	2.28	-	2.28	-	2.28
6	MAR-VCU	MAR-VCU	-	-	-	3.76	-	3.76	-	3.76
7	MSS	MSS	-	-	-	10.59	-	10.59	-	10.59
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
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21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
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Notes:

Table 2F - SO_2
Project Emission Increase

Pollutant[1]: SO_2	Permit No.: TBD
Baseline Period: NA	

	Affected or Modified Facilities[2] FIN	EPN	Permit No.	Actual Emissions[3] (tons/yr)	A Baseline Emissions[4] (tons/yr)	B Proposed Emissions[5] (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A)[6] (tons/yr)	Correction[7] (tons/yr)	Project Increase[8] (tons/yr)
1	F-101	F-101	-	-	-	2.71	-	2.71	-	2.71
2	F-102	F-102	-	-	-	2.19	-	2.19	-	2.19
3	F-201	F-201	-	-	-	2.71	-	2.71	-	2.71
4	F-202	F-202	-	-	-	2.19	-	2.19	-	2.19
5	FL-101	FL-101	-	-	-	0.00	-	0.00	-	0.00
6	MAR-VCU	MAR-VCU	-	-	-	0.01	-	0.01	-	0.01
7	MSS	MSS	-	-	-	0.14	-	0.14	-	0.14
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
									Page Subtotal[9]:	*9.95*

Notes:

Table 2F - PM/PM_{10}
Project Emission Increase

Pollutant[1]: PM/PM_{10}	Permit No.: TBD
Baseline Period: NA	

	Affected or Modified Facilities[2] FIN	EPN	Permit No.	Actual Emissions[3] (tons/yr)	A Baseline Emissions[4] (tons/yr)	B Proposed Emissions[5] (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A)[6] (tons/yr)	Correction[7] (tons/yr)	Project Increase[8] (tons/yr)
1	F-101	F-101	-	-	-	3.36	-	3.36	-	3.36
2	F-102	F-102	-	-	-	2.72	-	2.72	-	2.72
3	F-201	F-201	-	-	-	3.36	-	3.36	-	3.36
4	F-202	F-202	-	-	-	2.72	-	2.72	-	2.72
5	MAR-VCU	MAR-VCU	-	-	-	-	-	-	-	-
6	MSS	MSS	-	-	-	0.28	-	0.28	-	0.28
7	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
									Page Subtotal[9]:	*12.44*

Notes:

Table 2F - $PM_{2.5}$
Project Emission Increase

Pollutant[1]: $PM_{2.5}$	**Permit No.: TBD**
Baseline Period: NA	

	Affected or Modified Facilities[2]		Permit No.	Actual Emissions[3] (tons/yr)	A Baseline Emissions[4] (tons/yr)	B Proposed Emissions[5] (tons/yr)	Projected Actual Emissions (tons/yr)	Difference (B-A)[6] (tons/yr)	Correction[7] (tons/yr)	Project Increase[8] (tons/yr)
	FIN	EPN								
1	F-101	F-101	-	-	-	2.26	-	2.26	-	2.26
2	F-102	F-102	-	-	-	1.83	-	1.83	-	1.83
3	F-201	F-201	-	-	-	2.26	-	2.26	-	2.26
4	F-202	F-202	-	-	-	1.83	-	1.83	-	1.83
5	MAR-VCU	MAR-VCU	-	-	-	-	-	-	-	-
6	MSS	MSS	-	-	-	0.28	-	0.28	-	0.28
7	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
									Page Subtotal[9]:	***8.44***

Notes:

Section 9
General Application Requirements

Pursuant to 30 TAC §116.111, KMLT proposes to meet the rules and regulations of the TCEQ and the intent of the Texas Clean Air Act (TCAA). This section addresses each of those requirements.

9.1 Protection of Public Health and Welfare - 30 TAC §116.111(a)(2)(A)

The emissions from facilities included in this application will comply with all air quality rules and regulations and with the intent of the TCAA, including protection of public health and welfare. Applicable regulations for the Galena Park Terminal are as follows:

9.1.1 Chapter 101 - General Air Quality Rules

The facilities included in this application will operated in accordance with the General Rules relating to circumvention, nuisance, traffic hazard, notification requirements for emissions events and scheduled maintenance, startup and shutdown activities, sampling, sampling ports, emissions inventory requirements, sampling procedures, compliance with Environmental Protection Agency standards, the Primary and Secondary National Ambient Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

9.1.2 Chapter 106 – Permits by Rule

Facilities included in this application are subject to and will comply with the applicable requirements of 30 TAC Chapter 106. Specifically, maintenance, startup and shutdown activities associated with the facilities in this application comply with the applicable requirements of 30 TAC 106.263.

9.1.3 Chapter 111 – Visible Emissions and Particulate Matter

The Galena Park Terminal is subject to and will operate in compliance with the applicable requirements of 30 TAC Chapter 111.

9.1.4 Chapter 112 – Sulfur Compounds

The Galena Park Terminal is subject to and will operate in compliance with the applicable requirements of 30 TAC Chapter 112.

9.1.5 Chapter 113 – Toxic Materials

This chapter references the regulations under 40 CFR Part 63. Applicability for those regulations is addressed in Section 9.6.

9.1.6 Chapter 114 – Motor Vehicles

There are no motor vehicles specifically associated with the facilities included in this application. To the extent that motor vehicles are owned by KMLT, the company will comply with applicable requirements in 30 TAC Chapter 114.

9.1.7 Chapter 115 - Volatile Organic Compounds (VOC)

Facilities included in this application are subject to and will operate in compliance with the following subchapters of 30 TAC Chapter 115:

Subchapter B, Division 1, Storage of VOC

Subchapter B, Division 2, Vent Gas Control

Subchapter D, Division 3, Fugitive Emissions Control

Subchapter F, Division 3, Degassing or Cleaning of Stationary, Marine, and Transport Vessels

9.1.8 Chapter 116 – New Construction or Modification

Facilities included in this application are subject to and will operate in compliance with the applicable requirements of 30 TAC Chapter 116.

9.1.9 Chapter 117 - Nitrogen Compounds

New sources subject to 30 TAC Chapter 117 include the heaters and vapor combustors. KMLT will comply with the applicable testing, reporting, and recordkeeping requirements in 30 TAC Chapter 117.

9.1.10 Chapter 118 – Air Pollution Episodes

Facilities included in this application are subject to and will operate in compliance with the applicable requirements of 30 TAC Chapter 118.

9.1.11 Chapter 122 – Federal Operating Permits

The KMLT Galena Park Terminal operates under Federal Operating Permit No. O-988. KMLT will submit a Title V permit application to incorporate applicable regulatory requirements for the facilities included in this application as necessary.

9.1.12 Impact on Schools

There are no schools located within 3,000 feet of the Galena Park Terminal.

9.2 Measurement of Emissions - 30 TAC §116.111(a)(2)(B)

Emissions will be sampled upon request of the Executive Director of the TCEQ.

9.3 BACT Technology - 30 TAC §116.111(a)(2)(C)

Section 5 of this application provides a detailed best available control technology analysis for the facilities included in this application.

9.4 NSPS - 30 TAC §116.111(a)(2)(D)

The Galena Park Terminal is subject to and will operate in compliance with the applicable requirements of the following New Source Performance Standard:

40 CFR 60,Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels For Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

9.5 NESHAP - 30 TAC §116.111(a)(2)(E)

The Galena Park Terminal is subject to and will operate in compliance with the applicable requirements of the following National Emission Standards for Hazardous Air Pollutants:

40 CFR Part 61, Subpart J	National Emission Standards for Equipment Leaks (Fugitive Emission Sources) of Benzene
40 CFR Part 61, Subpart Y	National Emission Standards for Benzene Emissions from Benzene Storage Vessels
40 CFR Part 61, Subpart BB	National Emission Standards for Benzene Emissions from Benzene Transfer Operations

9.6 NESHAP for Source Categories – 30 TAC §116.111(a)(2)(F)

The Galena Park Terminal is subject to and will operate in compliance with the applicable requirements of the following National Emission Standards for Hazardous Air Pollutants for Source Categories:

40 CFR Part 63, Subpart R	National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)
40 CFR Part 63, Subpart Y	National Emission Standards for Marine Tank Vessel Loading Operations
40 CFR Part 63, Subpart EEEE	National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)
40 CFR Part 63, Subpart GGGGG	National Emission Standards for Hazardous Air Pollutants: Site Remediation

9.7 Performance Demonstration - 30 TAC §116.111(a)(2)(G)

The facilities included in this application will perform as represented in the application and as required by the permit.

9.8 Nonattainment Review - 30 TAC §116.111(a)(2)(H)

Harris County is a severe nonattainment area for ozone. The proposed facilities included in this application will result in VOC and NO_x net contemporaneous emission increases that exceed the 25 tpy significant modification threshold; therefore, will be subject to the NNSR program for VOC and NO_x. KMLT will provide VOC offsets for the project in a ratio of 1.3 to 1.0 prior to the start of operation of the facilities included in this application. Section 5 of this permit application demonstrates that LAER technology will be used to control emissions from each facility included in this application that will emit VOC. See Section 8 for a detailed NNSR applicability analysis.

9.9 Prevention of Significant Deterioration Review – 30 TAC §116.111(a)(2)(I)

The Galena Park Terminal is considered a major source for PSD purposes and the NO_2, CO, SO_2, and $PM/PM_{10}/PM_{2.5}$ project emission increases are less than the applicable significant modification thresholds; therefore, PSD is not applicable. See Section 8 for a detailed PSD applicability analysis.

9.10 Air Dispersion Modeling – §116.111(a)(2)(J)

KMLT will provide dispersion modeling results demonstrating compliance with all applicable air quality standards and guidelines as requested by the TCEQ.

9.11 Hazardous Air Pollutants – 30 TAC §116.111(a)(2)(K)

The KMLT Galena Park Terminal is subject to the MACT standards referenced in Section 9.6; therefore, it is not an affected source subject to the requirements of FCAA 112(g).

9.12 Mass Cap and Trade Allowances – 30 TAC §116.111(a)(2)(L)

The Galena Park Terminal is subject to and will comply with the applicable requirements of the Mass Emissions Cap and Trade (MECT) program. Pursuant to 30 TAC §101.352(b), KMLT will have the required number of NO_x allocations in the compliance account no later than March 1 after each control period.

9.13 Public Notice – 30 TAC §116.111(b)

This project will result in the issuance of a new permit; therefore, KMLT is committing to undergo public notice for this application.

Appendix A

Routine Emission Calculation Details

Table A-1
Heater Emission Calculations
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Description	Pollutant	Maximum Short-Term CO (ppmv @ 3% O_2)	Annaul Average CO (ppmv @ 3% O2)	Max Firing Rate (MMBtu/hr)	Annual Average Firing Rate (MMBtu/hr)	Maximum F Factor (Fd) (scf/MMBtu)	Average F Factor (Fd) (scf/MMBtu)	Emission Factor (short)	Emission Factor (annual)	Emission Factor Units	Emissions (lb/hr)	Emissions (tpy)
F-101	Naphtha Splitter Reboiler	CO	400	50	129	103	8710	8710	0.296	0.037	lb/MMBtu	38.06	16.67
	Train I	NO_x							0.025	0.006	lb/MMBtu	3.22	2.71
		VOC							0.0054	0.0054	lb/MMBtu	0.69	2.43
		SO_2							0.006	0.006	lb/MMBtu	0.77	2.71
		PM/PM_{10}							0.00745	0.00745	lb/MMBtu	0.96	3.36
		$PM_{2.5}$							0.005	0.005	lb/MMBtu	0.64	2.26
		NH_3	10	10					0.007	0.007	lb/MMBtu	0.95	3.33
F-102	Combi Tower Reboiler	CO	400	50	104	83	8710	8710	0.296	0.037	lb/MMBtu	30.82	13.50
	Train I	NO_x							0.025	0.006	lb/MMBtu	2.61	2.19
		VOC							0.0054	0.0054	lb/MMBtu	0.56	1.97
		SO_2							0.006	0.006	lb/MMBtu	0.63	2.19
		PM/PM_{10}							0.00745	0.00745	lb/MMBtu	0.78	2.72
		$PM_{2.5}$							0.005	0.005	lb/MMBtu	0.52	1.83
		NH_3	10	10					0.007	0.007	lb/MMBtu	0.77	2.70
F-201	Naphtha Splitter Reboiler	CO	400	50	129	103	8710	8710	0.296	0.037	lb/MMBtu	38.06	16.67
	Train II	NO_x							0.025	0.006	lb/MMBtu	3.22	2.71
		VOC							0.0054	0.0054	lb/MMBtu	0.69	2.43
		SO_2							0.006	0.006	lb/MMBtu	0.77	2.71
		PM/PM_{10}							0.00745	0.00745	lb/MMBtu	0.96	3.36
		$PM_{2.5}$							0.005	0.005	lb/MMBtu	0.64	2.26
		NH_3	10	10					0.007	0.007	lb/MMBtu	0.95	3.33

Table A-1
Heater Emission Calculations
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Description	Pollutant	Maximum Short-Term CO (ppmv @ 3% O_2)	Annaul Average CO (ppmv @ 3% O2)	Max Firing Rate (MMBtu/hr)	Annual Average Firing Rate (MMBtu/hr)	Maximum F Factor (Fd) (scf/MMBtu)	Average F Factor (Fd) (scf/MMBtu)	Emission Factor (short)	Emission Factor (annual)	Emission Factor Units	Emissions (lb/hr)	Emissions (tpy)
F-202	Combi Tower Reboiler Train II	CO	400	50	104	83	8710	8710	0.296	0.037	lb/MMBtu	30.82	13.50
		NO_x							0.025	0.006	lb/MMBtu	2.61	2.19
		VOC							0.0054	0.0054	lb/MMBtu	0.56	1.97
		SO_2							0.006	0.006	lb/MMBtu	0.63	2.19
		PM/PM_{10}							0.00745	0.00745	lb/MMBtu	0.78	2.72
		$PM_{2.5}$							0.005	0.005	lb/MMBtu	0.52	1.83
		NH_3	10	10					0.007	0.007	lb/MMBtu	0.77	3.33

Table A-2
Routine Flare Emissions (EPN: FL-101)
KM Liquids Terminals LLC
Galena Park Terminal

Event: **Pilot Gas**
Maximum Gas Flow: 150 scfh
Average Gas Flow: 150 scfh

Component	Waste Stream										VOC EMISSIONS			LHV	Net Heat Release			Emission Factors		NOX AND CO EMISSIONS			
					Flow						Efficiency	Emissions						lb/MMBTU		NOX		CO	
	MW	Wt %	Mol%	Vol%	lb/hr	lb/yr	scf/hr	MMscf/yr	mol/hr	mol/yr	%	lb/hr	tpy	BTU/scf	BTU/scf	BTU/hr	MMBTU/yr	NOX	CO	lb/hr	tpy	lb/hr	tpy
Nitrogen	28.00	0.60%	0.38%	0.38%	0.04	371.32	0.57	0.01	0.00	13.26	0%	0.0424	0.1857	-	-	-	-	0.138	0.0000	0.00	0.00	0.00	0.00
Hydrogen	2.02	0.00%	0.00%	0.00%	0.00	0.17	0.00	0.00	0.00	0.08	99%	0.0000	0.0000	269	0	1	0	0.138	0.0000	0.00	0.00	0.00	0.00
Methane	16.00	82.18%	91.98%	91.98%	5.82	51,021.31	137.96	1.21	0.36	3,188.83	99%	0.0582	0.2551	892	821	123,110	1,078	0.138	0.5496	0.02	0.07	0.07	0.30
Ethane	30.07	3.43%	2.04%	2.04%	0.24	2,126.56	3.06	0.03	0.01	70.72	99%	0.0024	0.0106	1,588	32	4,859	43	0.138	0.5496	0.00	0.00	0.00	0.01
Propane	44.09	1.03%	0.42%	0.42%	0.07	640.36	0.63	0.01	0.00	14.52	99%	0.0007	0.0032	2,273	10	1,428	13	0.138	0.5496	0.00	0.00	0.00	0.00
n-Butane	58.12	0.45%	0.14%	0.14%	0.03	278.06	0.21	0.00	0.00	4.78	98%	0.0006	0.0028	2,957	4	612	5	0.138	0.5496	0.00	0.00	0.00	0.00
Butenes	56.10	0.42%	0.13%	0.13%	0.03	259.07	0.20	0.00	0.00	4.62	98%	0.0006	0.0026	2,828	4	565	5	0.138	0.5496	0.00	0.00	0.00	0.00
n-Pentane	72.14	0.19%	0.05%	0.05%	0.01	120.56	0.07	0.00	0.00	1.67	98%	0.0003	0.0012	3,609	2	261	2	0.138	0.5496	0.00	0.00	0.00	0.00
Isopentane	72.15	0.34%	0.09%	0.09%	0.02	214.12	0.13	0.00	0.00	2.97	98%	0.0005	0.0021	3,602	3	462	4	0.138	0.5496	0.00	0.00	0.00	0.00
Hexane (C6+)	86.17	0.25%	0.05%	0.05%	0.02	156.25	0.08	0.00	0.00	1.81	98%	0.0004	0.0016	4,287	2	336	3	0.138	0.5496	0.00	0.00	0.00	0.00
Carbon Dioxide	44.01	11.11%	4.52%	4.52%	0.79	6,898.45	6.78	0.06	0.02	156.75	0%	0.7875	3.4492	-	-	-	-	0.138	0.5496	0.00	0.00	0.00	0.00
TOTAL		100.00%	99.80%	99.80%	7.09	62,086.24	149.70	1.31	0.39	3,460.02		0.0031	0.0135		878	131,635	1,153			0.02	0.08	0.07	0.32
												totals are VOC only											

Event: **Purge Gas/Waste Gas**
Maximum Gas Flow: 5,000 scfh
Average Gas Flow: 1,000 scfh

Component	Waste Stream										VOC EMISSIONS			LHV	Net Heat Release			Emission Factors		NOX AND CO EMISSIONS			
					Flow						Efficiency	Emissions						lb/MMBTU		NOX		CO	
	MW	Wt %	Mol%	Vol%	lb/hr	lb/yr	scf/hr	MMscf/yr	mol/hr	mol/yr	%	lb/hr	tpy	BTU/scf	BTU/scf	BTU/hr	MMBTU/yr	NOX	CO	lb/hr	tpy	lb/hr	tpy
Nitrogen	28.00	1.76%	1.00%	1.00%	3.69	6,471.77	50.00	0.09	0.13	231.13	0%	3.6939	3.2359	-	-	-	-	0.138	0.0000	0.00	0.00	0.00	0.00
Hydrogen	2.02	3.53%	27.85%	27.85%	7.42	13,002.94	1392.50	2.44	3.67	6,437.10	99%	0.0742	0.0650	269	75	374,520	656	0.138	0.0000	0.05	0.05	0.00	0.00
Methane	16.00	56.06%	55.88%	55.88%	117.95	206,652.79	2794.00	4.90	7.37	12,915.80	99%	1.1795	1.0333	892	499	2,493,175	4,368	0.138	0.5496	0.34	0.30	1.37	1.20
Ethane	30.07	12.44%	6.60%	6.60%	26.18	45,871.43	330.00	0.58	0.87	1,525.49	99%	0.2618	0.2294	1,588	105	524,047	918	0.138	0.5496	0.07	0.06	0.29	0.25
Ethylene	28.05	2.90%	1.65%	1.65%	6.11	10,697.49	82.50	0.14	0.22	381.37	99%	0.0611	0.0535	1,471	24	121,387	213	0.138	0.5496	0.02	0.01	0.07	0.06
Propane	44.09	10.59%	3.83%	3.83%	22.28	39,032.24	191.50	0.34	0.51	885.25	99%	0.2228	0.1952	2,273	87	435,320	763	0.138	0.5496	0.06	0.05	0.24	0.21
Propylene	42.00	1.13%	0.43%	0.43%	2.38	4,174.29	21.50	0.04	0.06	99.39	99%	0.0238	0.0209	2,142	9	46,053	81	0.138	0.5496	0.01	0.01	0.03	0.02
n-Butane	58.12	4.66%	1.28%	1.28%	9.81	17,194.34	64.00	0.11	0.17	295.85	98%	0.1963	0.1719	2,957	38	189,248	332	0.138	0.5496	0.03	0.02	0.10	0.09
Butenes	56.10	0.56%	0.16%	0.16%	1.18	2,074.66	8.00	0.01	0.02	36.98	98%	0.0237	0.0207	2,828	5	22,624	40	0.138	0.5496	0.00	0.00	0.01	0.01
1,3-Butadiene	54.09	0.47%	0.14%	0.14%	1.00	1,750.29	7.00	0.01	0.02	32.36	98%	0.0200	0.0175	2,828	4	19,796	35	0.138	0.5496	0.00	0.00	0.01	0.01
n-Pentane	72.14	0.81%	0.18%	0.18%	1.71	3,001.49	9.00	0.02	0.02	41.60	98%	0.0343	0.0300	3,609	6	32,481	57	0.138	0.5496	0.00	0.00	0.02	0.02
n-Pentene	70.13	0.09%	0.02%	0.02%	0.19	324.19	1.00	0.00	0.00	4.62	98%	0.0037	0.0032	3,609	1	3,609	6	0.138	0.5496	0.00	0.00	0.00	0.00
Isopentane	72.15	0.09%	0.02%	0.02%	0.19	333.53	1.00	0.00	0.00	4.62	98%	0.0038	0.0033	3,602	1	3,602	6	0.138	0.5496	0.00	0.00	0.00	0.00
Cyclohexane	84.16	1.85%	0.35%	0.35%	3.89	6,808.30	17.50	0.03	0.05	80.90	98%	0.0777	0.0681	4,287	15	75,023	131	0.138	0.5496	0.01	0.01	0.04	0.04
Hexane	86.17	0.59%	0.11%	0.11%	1.25	2,190.86	5.50	0.01	0.01	25.42	98%	0.0250	0.0219	4,287	5	23,579	41	0.138	0.5496	0.00	0.00	0.01	0.01
Benzene	78.11	2.45%	0.50%	0.50%	5.15	9,026.96	25.00	0.04	0.07	115.57	98%	0.1030	0.0903	3,525	18	88,125	154	0.138	0.5496	0.01	0.01	0.05	0.04
Ammonia	17.03	0.00%	0.00%	0.00%	0.01	11.02	0.14	0.00	0.00	0.65	98%	0.0001	0.0001	45	0	6	0	0.138	0.5496	0.00	0.00	0.00	0.00
Hydrogen Sulfide	34.08	0.00%	0.00%	0.00%	0.00	1.29	0.01	0.00	0.00	0.04	98%	0.0000	0.0000	596	0	5	0	0.138	0.5496	0.00	0.00	0.00	0.00
Sulfur Dioxide	64.00	0.00%	0.00%	0.00%	-	-	-	-	-	-	0%	0.0014	0.0012	-	-	-	-	0.000	0.000	0.00	0.00	0.00	0.00
TOTAL		100.00%	100.00%	100.00%	210.40	368,619.87	5,000.15	8.76	13.19	23,114.14		0.7952	0.6966		891	4,452,600	7,801			0.61	0.54	2.24	1.96
												totals are VOC only											

Notes:

1. The VOC speciation and flow rates utlized in the emission calculations are based on typical compositions and flows that may vary based on process conditions.

Table A-3
StorageTank Working and Breathing Emissions Summary
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Tank Type	Service	Maximum Inbound/Outbound Pump Rate (bbls/hr)	Tank Capacity (bbls)	No. of Turnovers per year	VOC Emissions Rates		
						(lbs/hr)	TANKS 4.0 Total Losses (lbs/yr)	(tpy)
200-201	IFR	Feed Stock (RVP-13)	15,000	200,000	56	***2.28***	9,249.92	**4.62**
200-202	IFR	Feed Stock (RVP-13)	15,000	200,000	56	***2.28***	9,249.92	**4.62**
200-203	IFR	Feed Stock (RVP-13)	15,000	200,000	56	***2.28***	9,249.92	**4.62**
100-201	IFR	Light Naphtha (RVP-13)	7,500	100,000	48	***1.10***	3,805.99	**1.90**
100-202	IFR	Light Naphtha (RVP-13)	7,500	100,000	48	***1.10***	3,805.99	**1.90**
100-209	IFR	Light Naphtha (RVP-13)	7,500	100,000	48	***1.10***	3,805.99	**1.90**
100-203	IFR	Heavy Naphtha (RVP-7)	7,500	100,000	48	***1.10***	1,712.70	**0.86**
100-204	IFR	Heavy Naphtha (RVP-7)	7,500	100,000	48	***1.10***	1,712.70	**0.86**
100-210	IFR	Heavy Naphtha (RVP-7)	7,500	100,000	48	***1.10***	1,712.70	**0.86**
5-201	IFR	Wastewater	5,000	5,000	48	***1.33***	1,974.48	**0.99**
100-205	FXD	Kerosene/Diesel	7,500	100,000	48	***14.24***	5,837.01	**2.92**
100-206	FXD	Kerosene/Diesel	7,500	100,000	48	***14.24***	5,837.01	**2.92**
100-211	FXD	Kerosene/Diesel	7,500	100,000	48	***14.24***	5,837.01	**2.92**
100-207	FXD	Resid JP54	7,500	100,000	48	***14.24***	7,272.00	**3.64**

Updated 2/22/2012

EPN	Tank Type	Service	Maximum Inbound/Outbound Pump Rate (bbls/hr)	Tank Capacity (bbls)	No. of Turnovers per year	VOC Emissions Rates		
						(lbs/hr)	TANKS 4.0 Total Losses (lbs/yr)	(tpy)
100-208	FXD	Resid JP54	7,500	100,000	48	***14.24***	7,272.00	**3.64**
100-212	FXD	Resid JP55	7,500	100,000	48	***14.24***	7,272.00	**3.64**
1-201	FXD	Surge	1,000	1,000	48	***1.90***	73.54	**0.04**
B5-201	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
B5-202	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
B5-203	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
B5-204	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
B5-205	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
B5-206	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
B5-207	PRS	Y-Grade	-	-	-	***0.00***	0.00	**0.00**
			Emission Totals			***102.09***	***85,680.88***	***42.84***

Updated 2/22/2012

Table A-4
Floating Roof Storage Tank Gasoline Short-Term Working and Breathing Emissions Summary
KM Liquids Terminals LLC
Galena Park Terminal

	Tank Name:				**200-201**	**100-201**	**100-203**	**5-201**
	Tank Type:				**IFR**	**IFR**	**IFR**	**IFR**
	Product:				Feed Stock (RVP-13)	Light Naphtha (RVP-13)	Heavy Naphtha (RVP-7)	Wastewater
Tank Data	Diameter	D	ft		174	123	123	41
	Paint Color	-	-		White	White	White	White
	Paint Solar Absorptance	α	-		0.17	0.17	0.17	0.17
	Maximum Withdrawal Rate	Q max	bbl/hr		15,000	7,500	7,500	5,000
	Shell Clingage	C	bbl/ft^2		0.0015	0.0015	0.0015	0.0015
	No. of Columns	N_C	-		12	1	1	1
	Column Diameter	F_C	ft		1.0	1.0	1.0	1.0
	Deck Fitting Factor	F_F	lb-mole/yr		519.8	173.80	173.80	112.68
	Deck (Welded or Bolted)	-	-		Welded	Welded	Welded	Welded
	Deck Seam Loss Factor	K_D	lb-mole/ft·yr		0	0	0	0
	Deck Seam Length Factor	S_D	ft/ft^2		0	0	0	0
	Product Factor	K_C	-		1.00	1.00	1.00	1.00
	Rim Seal Factor	K_R	lb-mole/ft·yr		0.6	0.6	0.6	0.6
Product Data	Crude Oil Service?	-	Y/N		N	N	N	N
	Liquid Molecular Wt.	M_L	lb/lb-mole		92	92	92	92
	Vapor Molecular Wt.	M_V	lb/lb-mole		66	66	66	66
	Liquid Density	W_l	lb/gal		5.6	5.6	5.6	5.6
	Reid Vapor Pressure	RVP	psi		13.5	13.5	13.5	13.5
	Slope	Sl	°F/vol %		3	3	3	3
	C-C Vapor Pressure Equation Constant A	A	dimensionless		11.64	11.64	11.64	11.64
	C-C Vapor Pressure Equation Constant B	B	ºR		5043.58	5043.58	5043.58	5043.58
	Vapor Pressure Method		-		RVP	RVP	RVP	RVP
	Ideal Gas Constant	R	(ft^3-psia)/(lb-mole-ºR)		10.731	10.731	10.731	10.731
Maximum Short-Term Emissions	Month		-		September	September	September	September
	Daily Total Solar Insolation Factor	I	Btu/ft^2·d		1471.00	1471.00	1471.00	1471.00
	Daily Maximum Ambient Temperature	T_{AX}	ºF		88.7	88.7	88.7	88.7
	Daily Minimum Ambient Temperature	T_{AN}	ºF		68.1	68.1	68.1	68.1
	Daily Ambient Temp. Change	DT_A	ºR	$T_{AX} - T_{AN}$	20.60	20.60	20.60	20.60
	Daily Avg. Ambient Temperature	T_{AA}	ºR	$((T_{AX}+459.67)+(T_{AN}+459.67))/2$	538.07	538.07	538.07	538.07
	Liquid Bulk Temperature	T_b	ºR	$T_{AA} + 6α -1$	538.09	538.09	538.09	538.09
	Daily Avg. Liquid Surface Temp.	T_{LA}	ºR	$0.44T_{AA}+0.56T_{Tb}+0.0079(α*I)$	540.06	540.06	540.06	540.06
	Daily Max. Liq. Surf. Temp.	T_{LX}	ºR	$T_{LA}+0.25*DT_V$	545.52	545.52	545.52	545.52
	Daily Vapor Temperature Range	DT_V	ºR	$0.72*DT_A+0.028*α*I$	21.83	21.83	21.83	21.83
	True Vapor Pressure @ T_{LX}	P_{VX}	psia @ $\mathbf{T_{LX}}$		10.96	10.96	10.96	10.96
	Vapor Pressure Function	P*	dimensionless	$P_{VX}/P_A/(1+(1-(P_{VX}/P_A))$^0.5)^2	0.33	0.33	0.33	0.33
	Rim Seal Loss	L_R	lb/yr	$(K_R)(P^*)(D)(M_V)(K_C)$	2,270.88	1,605.27	1,605.27	535.09
	Deck Fitting Loss	L_F	lb/yr	$(F_F)(P^*)(M_V)(K_C)$	11,306.52	3,780.44	3,780.44	2,450.98
	Deck Seam Loss	L_D	lb/yr	$(K_D)(S_D)(D$^2)$(P^*)(M_V)(K_C)$	0.00	0.00	0.00	0.00
	Withdrawal Loss	L_{WD}	lb/yr	$[(0.943)(Qmax)(C)(W_l)/(D)](1+[(N_c)(F_C)]/D)$	6,394.41	4,265.48	4,265.48	8,668.55
	Total VOC Loss	$\mathbf{L_T}$	**lb/hr**	$\mathbf{(L_R+L_F+L_D+L_{WD})/8760}$	**2.28**	**1.10**	**1.10**	**1.33**

Updated 9/10/2009

Table A-5
Fixed Roof Storage Tanks Short-Term Working and Breathing Emissions Summary
KM Liquids Terminals LLC
Galena Park Terminal

	Tank Name:				**100-205**	**100-207**	**1-201**
	Tank Type:				**VFR**	**VFR**	**VFR**
	Product:				**Kerosene/Diesel**	**Resid JP54**	**Surge**
Tank Data	Paint Solar Absorptance	α	-		0.17	0.17	0.17
	Maximum Filling Rate	Q max	bbl/hr		7,500	7,500	1,000
	Annual Throughput	Q	bbls/year		5,455,548	5,455,548	53,872
Product Data	Crude Oil Service?	-	Y/N		N	N	N
	Liquid Molecular Wt.	M_L	lb/lb-mole		188	162	162
	Vapor Molecular Wt.	M_V	lb/lb-mole		130	130	130
	Reid Vapor Pressure	RVP	psi				
	Slope	Sl	°F/vol %				
	C-C Vapor Pressure Equation Constant A	A	dimensionless		12.101	12.101	12.101
	C-C Vapor Pressure Equation Constant B	B	ºR		8907.0	8907.0	8907.0
	Vapor Pressure Method		-		C-C	C-C	C-C
	Ideal Gas Constant	R	$(ft^3$-psia)/(lb-mole-ºR)		10.731	10.731	10.731
Maximum Short-Term Emissions	Month		-		September	September	September
	Daily Total Solar Insolation Factor	I	$Btu/ft^2 \cdot d$		1471.00	1471.00	1471.00
	Daily Maximum Ambient Temperature	T_{AX}	ºF		88.7	88.7	88.7
	Daily Minimum Ambient Temperature	T_{AN}	ºF		68.1	68.1	68.1
	Daily Ambient Temp. Change	DT_A	ºR	$T_{AX} - T_{AN}$	20.60	20.60	20.60
	Daily Avg. Ambient Temperature	T_{AA}	ºR	$((T_{AX}+459.67)+(T_{AN}+459.67))/2$	538.07	538.07	538.07
	Liquid Bulk Temperature	T_b	ºR	$T_{AA} + 6\alpha - 1$	538.09	538.09	538.09
	Daily Avg. Liquid Surface Temp.	T_{LA}	ºR	$0.44T_{AA}+0.56_{Tb}+0.0079(\alpha*I)$	540.06	540.06	540.06
	Daily Max. Liq. Surf. Temp.	$\mathbf{T_{LX}}$	ºR	$T_{LA}+0.25*DT_V$	545.52	545.52	545.52
	Daily Vapor Temperature Range	DT_V	ºR	$0.72*DT_A+0.028*\alpha*I$	21.83	21.83	21.83
	True Vapor Pressure @ T_{LX}	P_{VX}	psia @ $\mathbf{T_{LX}}$		0.015	0.015	0.015
	Vapor Pressure Function	P*	dimensionless	$P_{VX}/P_A/(1+(1-(P_{VX}/P_A))$^0.5)^2	0.0002	0.0002	0.0002
	Working Loss	L_W	lb/yr	$0.0010*M_V*P_{VX}*Q*K_N*K_p$	10,355.16	10,355.16	102.25
	Total VOC Loss	$\mathbf{L_{MAX}}$	**lb/hr**	**(Lw*Qmax)/(Q*42)**	**14.24**	**14.24**	**1.90**

Table A-6
Fugitive Emissions (EPN: FUG)
KM Liquids Terminals LLC
Galena Park Terminal

Component Type	Stream Type	Emission Factor SOCMI Without C_2	Number of Components	Control Efficiency	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Valves	Light Liquid	0.0035	990	97%	0.10	0.46
	Gas/Vapor	0.0089	990	97%	0.26	1.16
	Heavy Liquid	0.0007	990	30%	0.49	2.13
Pumps	Light Liquid	0.0386	28	85%	0.16	0.70
	Heavy Liquid	0.0161	28	30%	0.31	1.36
Flanges	Light Liquid	0.0005	2,970	97%	0.04	0.20
	Gas/Vapor	0.0029	2,970	97%	0.26	1.13
	Heavy Liquid	0.00007	2,970	30%	0.15	0.64
		Total Fugitive Emissions			***1.77***	***7.76***

Notes:

Table A-7
Marine Loading Emissions (EPNs: MAR-LOADFUG & MAR-VCU)
KM Liquids Terminals LLC
Galena Park Terminal

Basis

Emissions calculated based on loading loss factors (Tables 5.2-1, AP-42, Section 5.2).
Saturation factor assumed to be 0.2 (ships) and 0.5 (barges), submerged loading.
VP based on maximum expected liquid temperature for the short-term and annual average liquid temperature for the annual basis.

											Uncollected Fugitives EPN: MAR-LOADFUG		Controlled Emissions EPN: MAR-VCU	
PRODUCT	LOAD TYPE	Collection Efficiency (%)	Control Efficiency (%)	MW	Short-Term Max VP	Annual Average VP	Short-Term Loading Loss Factor	Annual Loading Loss Factor	Throughput (bbl/hr)	Throughput (bbl/yr)	LBS/HR	TPY	lbs/hr	tpy
Light Naphtha	Ship	95%	99%	66	11	8.42	3.3318 lb/1000 gal	2.6228 lb/1000 gal	10,000 bbl/hr	7,256,200 bbl/yr	69.97 lbs/hr	19.98 tpy	13.29 lbs/hr	3.80 tpy
Heavy Naphtha	Ship	95%	99%	66	7	4.18	5.3007 lb/1000 gal	3.2552 lb/1000 gal	10,000 bbl/hr	6,993,400 bbl/yr	111.31 lbs/hr	23.90 tpy	21.15 lbs/hr	4.54 tpy
Resid	Ship	0%	0%	130	0.02	0.02	0.0119 lb/1000 gal	0.0123 lb/1000 gal	10,000 bbl/hr	1,630,820 bbl/yr	5.01 lbs/hr	0.42 tpy	0.00 lbs/hr	0.00 tpy
Resid	Barge	0%	0%	130	0.02	0.02	0.0298 lb/1000 gal	0.0307 lb/1000 gal	0 bbl/hr	0 bbl/yr	0.00 lbs/hr	0.00 tpy	0.00 lbs/hr	0.00 tpy
Distillate	Ship	0%	0%	130	0.02	0.02	0.0298 lb/1000 gal	0.0307 lb/1000 gal	10,000 bbl/hr	104,755 bbl/yr	12.53 lbs/hr	0.07 tpy	0.00 lbs/hr	0.00 tpy
Distillate	Barge	0%	0%	130	0.02	0.02	0.0298 lb/1000 gal	0.0307 lb/1000 gal	10,000 bbl/hr	419,020 bbl/yr	12.53 lbs/hr	0.27 tpy	0.00 lbs/hr	0.00 tpy
										Totals:	***211.35 lbs/hr***	***44.64 tpy***	***34.44 lbs/hr***	***8.34 tpy***

Notes:

1. Marine loading activities associated with the proposed condensate splitter will utilize any combination of existing docks at the Galena Park Terminal. Specifically, KMLT will manage the simultaneous loading authorized by this permit at any one or combination of docks such that the emission totals comply with the proposed emission limits.

Table A-8
Controlled Marine Loading (EPN: MAR-VCU)
KM Liquids Terminals LLC
Galena Park Terminal

Basis
Used NO_x and CO emissions factors prvided by vendor.
Assumed all products have a maximum heat content equivalent to 20,000 Btu/lb.
The short-term vapor flow rate to the VCU is based on a pump rate of 20,000 bbls/hr.

Operation Type	Soure	Hourly		Annual	
		Vapors lb/hr	Heat Release MMBtu/hr	Vapors lb/yr	Heat Release MMBtu/yr
Barge/Ship Loading	Barge/Ship Docks	3,444	68.89	1,667,681	33,353.62

Operation Type	Pollutant	Emissions Factor		Emissions	
		(Value)	(Units)	(lb/hr)	(ton/yr)
Barge/Ship Loading	VOC	99%	DRE	34.44	8.34
	NO_x	0.1500	lb/MMBtu	10.33	2.50
	CO	0.2000	lb/MMBtu	13.78	3.34
	SO_2	0.0006	lb/MMBtu	0.04	0.01
	$PM/PM_{10}/PM_{2.5}$	0.0000	lb/MMBtu	0.00	0.00

Sample Equation for NOx from the flare
(0.15 lb/MMBtu) (179.50 MMBtu/hr) = 26.92 lb/hr
(0.15 lb/MMBtu) (24,206.68 MMBtu/yr) (1 tn/2,000 lb) =1.82 tn/yr

Pilot/Assist Gas Emissions

Total natural gas combusted = 8.0 scfm

Natural gas heating value = 1020 btu/scf, based on LHV

Pollutant	Emission factor		Total Gas Flow	Operating Hours	Emissions	
	(Value)	(Units)	scfh	(hrs/yr)	(lb/hr)	(tons/yr)
NO_X	0.1500	lb/MMBtu	480	8,760	0.073	0.32
CO	0.2000	lb/MMBtu	480	8,760	0.098	0.43
SO_2	0.0006	lb/MMBtu	480	8,760	0.000	0.00
$PM/PM_{10}/PM_{2.5}$	0.0000	lb/MMBtu	480	8,760	0.000	0.00

Notes:
1. The hourly heat release calcuation is an estimate only for permitting purposes and may vary from manufacture design data.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	200-201 - Cable Suspended Roof
City:	Galena Park
State:	Texas
Company:	KM Liquids Terminals LLC
Type of Tank:	Internal Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	174.00
Volume (gallons):	8,400,000.00
Turnovers:	56.00
Self Supp. Roof? (y/n):	N
No. of Columns:	12.00
Eff. Col. Diam. (ft):	1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	12
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	100

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

200-201 - Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Light Naphtha	Jan	61.33	56.49	66.17	67.93	7.2249	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Feb	63.24	57.86	68.61	67.93	7.4803	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Mar	66.49	61.09	71.90	67.93	7.9331	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Apr	70.21	64.66	75.75	67.93	8.4753	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	May	73.22	67.46	78.98	67.93	8.9357	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Jun	75.96	70.18	81.75	67.93	9.3724	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Jul	76.90	71.00	82.80	67.93	9.5252	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Aug	76.62	70.81	82.43	67.93	9.4797	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Sep	74.50	68.97	80.03	67.93	9.1383	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Oct	70.45	64.55	76.36	67.93	8.5120	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Nov	66.19	60.93	71.45	67.93	7.8899	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Dec	62.62	57.63	67.61	67.93	7.3974	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

200-201 - Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	96.1362	100.9786	109.9571	121.4545	131.9431	142.5990	146.5091	145.3339	136.7958	122.2648	109.0774	99.3891
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.1674	0.1759	0.1915	0.2115	0.2298	0.2483	0.2552	0.2531	0.2382	0.2129	0.1900	0.1731
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.2249	7.4803	7.9331	8.4753	8.9357	9.3724	9.5252	9.4797	9.1383	8.5120	7.8899	7.3974
Tank Diameter (ft):	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752	42.1752
Number of Columns:	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000	36,400,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000
Tank Diameter (ft):	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000
Deck Fitting Losses (lb):	478.6554	502.7651	547.4684	604.7129	656.9353	709.9900	729.4580	723.6068	681.0961	608.7476	543.0885	494.8512
Value of Vapor Pressure Function:	0.1674	0.1759	0.1915	0.2115	0.2298	0.2483	0.2552	0.2531	0.2382	0.2129	0.1900	0.1731
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000	519.8000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800	4,042.3800
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000	174.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	616.9668	645.9189	699.6008	768.3426	831.0537	894.7642	918.1424	911.1159	860.0671	773.1876	694.3412	636.4155

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	22.4331
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1	11.00	46.00	1.40	154.2277
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1	8.60	12.00	0.81	120.5780
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	12	25.00	0.00	0.00	4,206.2101
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	260.7850
Roof Drain (3-in. Diameter)/90% Closed	100	1.80	0.14	1.10	2,523.7260

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

200-201 - Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Light Naphtha	1,462.44	506.10	7,281.38	0.00	9,249.92

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	100-201 - Cable Suspended Roof
City:	Galena Park
State:	Texas
Company:	KM Liquids Terminals LLC
Type of Tank:	Internal Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):		123.00
Volume (gallons):		4,200,000.00
Turnovers:		48.00
Self Supp. Roof? (y/n):	N	
No. of Columns:		1.00
Eff. Col. Diam. (ft):		1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Roof Drain (3-in. Diameter)/90% Closed	64

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

100-201 - Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Light Naphtha	Jan	61.33	56.49	66.17	67.93	7.2249	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Feb	63.24	57.86	68.61	67.93	7.4803	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Mar	66.49	61.09	71.90	67.93	7.9331	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Apr	70.21	64.66	75.75	67.93	8.4753	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	May	73.22	67.46	78.98	67.93	8.9357	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Jun	75.96	70.18	81.75	67.93	9.3724	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Jul	76.90	71.00	82.80	67.93	9.5252	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Aug	76.62	70.81	82.43	67.93	9.4797	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Sep	74.50	68.97	80.03	67.93	9.1383	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Oct	70.45	64.55	76.36	67.93	8.5120	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Nov	66.19	60.93	71.45	67.93	7.8899	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
Light Naphtha	Dec	62.62	57.63	67.61	67.93	7.3974	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

100-201 - Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	67.9584	71.3814	77.7283	85.8557	93.2702	100.8027	103.5668	102.7360	96.7004	86.4286	77.1064	70.2578
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.1674	0.1759	0.1915	0.2115	0.2298	0.2483	0.2552	0.2531	0.2382	0.2129	0.1900	0.1731
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.2249	7.4803	7.9331	8.4753	8.9357	9.3724	9.5252	9.4797	9.1383	8.5120	7.8899	7.3974
Tank Diameter (ft):	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000
Tank Diameter (ft):	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000
Deck Fitting Losses (lb):	160.0429	168.1042	183.0512	202.1914	219.6525	237.3918	243.9011	241.9447	227.7309	203.5405	181.5867	165.4581
Value of Vapor Pressure Function:	0.1674	0.1759	0.1915	0.2115	0.2298	0.2483	0.2552	0.2531	0.2382	0.2129	0.1900	0.1731
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	256.1348	267.6192	288.9131	316.1807	341.0562	366.3281	375.6014	372.8143	352.5649	318.1026	286.8267	263.8495

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	22.4331
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	1	25.00	0.00	0.00	350.5175
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1	11.00	46.00	1.40	154.2277
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1	8.60	12.00	0.81	120.5780
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	173.8567
Roof Drain (3-in. Diameter)/90% Closed	64	1.80	0.14	1.10	1,615.1847

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

100-201 - Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Light Naphtha	1,033.79	337.60	2,434.60	0.00	3,805.99

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	100-203 Cable Suspended Roof
City:	Galena Park
State:	Texas
Company:	KM Liquids Terminals LLC
Type of Tank:	Internal Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):	123.00
Volume (gallons):	4,200,000.00
Turnovers:	48.00
Self Supp. Roof? (y/n):	N
No. of Columns:	1.00
Eff. Col. Diam. (ft):	1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Roof Drain (3-in. Diameter)/90% Closed	64

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

100-203 Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Heavy Naphtha	Jan	61.33	56.49	66.17	67.93	3.5188	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Feb	63.24	57.86	68.61	67.93	3.6597	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Mar	66.49	61.09	71.90	67.93	3.9108	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Apr	70.21	64.66	75.75	67.93	4.2140	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	May	73.22	67.46	78.98	67.93	4.4735	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Jun	75.96	70.18	81.75	67.93	4.7212	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Jul	76.90	71.00	82.80	67.93	4.8082	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Aug	76.62	70.81	82.43	67.93	4.7822	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Sep	74.50	68.97	80.03	67.93	4.5882	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Oct	70.45	64.55	76.36	67.93	4.2346	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Nov	66.19	60.93	71.45	67.93	3.8868	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5
Heavy Naphtha	Dec	62.62	57.63	67.61	67.93	3.6139	N/A	N/A	66.0000			92.00	Option 4: RVP=7, ASTM Slope=2.5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

100-203 Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	27.7156	28.9953	31.3166	34.1896	36.7119	39.1772	40.0573	39.7942	37.8468	34.3879	31.0921	28.5774
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.0683	0.0714	0.0772	0.0842	0.0904	0.0965	0.0987	0.0980	0.0932	0.0847	0.0766	0.0704
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.5188	3.6597	3.9108	4.2140	4.4735	4.7212	4.8082	4.7822	4.5882	4.2346	3.8868	3.6139
Tank Diameter (ft):	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336	28.1336
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000	18,200,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000
Tank Diameter (ft):	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000
Deck Fitting Losses (lb):	65.2707	68.2844	73.7510	80.5171	86.4571	92.2629	94.3354	93.7158	89.1297	80.9839	73.2224	67.3002
Value of Vapor Pressure Function:	0.0683	0.0714	0.0772	0.0842	0.0904	0.0965	0.0987	0.0980	0.0932	0.0847	0.0766	0.0704
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000	173.8000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900	2,019.9900
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000	123.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	121.1199	125.4133	133.2011	142.8403	151.3026	159.5737	162.5263	161.6435	155.1100	143.5054	132.4481	124.0111

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	8.8929
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	1	25.00	0.00	0.00	138.9512
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1	11.00	46.00	1.40	61.1385
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1	8.60	12.00	0.81	47.7992
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	68.9198
Roof Drain (3-in. Diameter)/90% Closed	64	1.80	0.14	1.10	640.2873

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

100-203 Cable Suspended Roof - Internal Floating Roof Tank
Galena Park, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Heavy Naphtha	409.86	337.60	965.23	0.00	1,712.70

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	5-201
City:	Galena Park
State:	Texas
Company:	KM Liquids Terminals LLC
Type of Tank:	Internal Floating Roof Tank
Description:	

Tank Dimensions

Diameter (ft):		41.00
Volume (gallons):		210,000.00
Turnovers:		48.00
Self Supp. Roof? (y/n):	N	
No. of Columns:		1.00
Eff. Col. Diam. (ft):		1.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Detail
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	29
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	36
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

5-201 - Internal Floating Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
KM Wastewater	Jan	61.33	56.49	66.17	67.93	7.2249	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Feb	63.24	57.86	68.61	67.93	7.4803	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Mar	66.49	61.09	71.90	67.93	7.9331	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Apr	70.21	64.66	75.75	67.93	8.4753	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	May	73.22	67.46	78.98	67.93	8.9357	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Jun	75.96	70.18	81.75	67.93	9.3724	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Jul	76.90	71.00	82.80	67.93	9.5252	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Aug	76.62	70.81	82.43	67.93	9.4797	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Sep	74.50	68.97	80.03	67.93	9.1383	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Oct	70.45	64.55	76.36	67.93	8.5120	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Nov	66.19	60.93	71.45	67.93	7.8899	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5
KM Wastewater	Dec	62.62	57.63	67.61	67.93	7.3974	N/A	N/A	66.0000			92.00	Option 4: RVP=13, ASTM Slope=3.5

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

5-201 - Internal Floating Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	22.6528	23.7938	25.9094	28.6186	31.0901	33.6009	34.5223	34.2453	32.2335	28.8095	25.7021	23.4193
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Value of Vapor Pressure Function:	0.1674	0.1759	0.1915	0.2115	0.2298	0.2483	0.2552	0.2531	0.2382	0.2129	0.1900	0.1731
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.2249	7.4803	7.9331	8.4753	8.9357	9.3724	9.5252	9.4797	9.1383	8.5120	7.8899	7.3974
Tank Diameter (ft):	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881	4.2881
Number of Columns:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Effective Column Diameter (ft):	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Net Throughput (gal/mo.):	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000	910,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000	5.6000
Tank Diameter (ft):	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000
Deck Fitting Losses (lb):	103.7608	108.9872	118.6778	131.0870	142.4076	153.9086	158.1288	156.8604	147.6451	131.9617	117.7284	107.2717
Value of Vapor Pressure Function:	0.1674	0.1759	0.1915	0.2115	0.2298	0.2483	0.2552	0.2531	0.2382	0.2129	0.1900	0.1731
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800	112.6800
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000	41.0000
Vapor Molecular Weight (lb/lb-mole):	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000	66.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	130.7017	137.0691	148.8754	163.9937	177.7857	191.7976	196.9391	195.3938	184.1666	165.0593	147.7186	134.9791

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	22.4331
Column Well (24-in. Diam.)/Pipe Col.-Sliding Cover, Gask.	1	25.00	0.00	0.00	350.5175
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	29	1.30	0.08	0.65	528.5804
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	36	0.53	0.11	0.13	267.5150
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	116.3718
Unslotted Guide-Pole Well/Gasketed Sliding Cover, w. Sleeve	1	8.60	12.00	0.81	120.5780
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	173.8567

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

5-201 - Internal Floating Roof Tank
Galena Park, Texas

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
KM Wastewater	344.60	51.46	1,578.43	0.00	1,974.48

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	100-205
City:	Galena Park
State:	Texas
Company:	KM LIquids Terminals LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):		50.00
Diameter (ft):		125.00
Liquid Height (ft) :		48.00
Avg. Liquid Height (ft):		30.00
Volume (gallons):		4,406,404.29
Turnovers:		48.00
Net Throughput(gal/yr):		229,133,022.89
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		4.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

100-205 - Vertical Fixed Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jan	61.33	56.49	66.17	67.93	0.0068	0.0058	0.0080	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Feb	63.24	57.86	68.61	67.93	0.0073	0.0061	0.0087	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Mar	66.49	61.09	71.90	67.93	0.0081	0.0068	0.0096	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Apr	70.21	64.66	75.75	67.93	0.0091	0.0077	0.0107	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	May	73.22	67.46	78.98	67.93	0.0100	0.0084	0.0117	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jun	75.96	70.18	81.75	67.93	0.0108	0.0091	0.0127	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Jul	76.90	71.00	82.80	67.93	0.0111	0.0093	0.0131	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Aug	76.62	70.81	82.43	67.93	0.0110	0.0092	0.0130	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Sep	74.50	68.97	80.03	67.93	0.0104	0.0087	0.0120	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Oct	70.45	64.55	76.36	67.93	0.0091	0.0076	0.0109	130.0000			188.00	Option 1: VP70 = .009 VP80 = .012
Distillate fuel oil no. 2	Nov	66.19	60.93	71.45	67.93	0.0080	0.0067	0.0094	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Dec	62.62	57.63	67.61	67.93	0.0072	0.0060	0.0084	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

100-205 - Vertical Fixed Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	42.4902	45.8184	55.9083	61.2035	71.5826	74.5126	80.4447	78.5390	68.4216	68.2224	52.1319	45.8373
Vapor Space Volume (cu ft):	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Space Expansion Factor:	0.0332	0.0372	0.0372	0.0380	0.0394	0.0394	0.0402	0.0395	0.0375	0.0407	0.0361	0.0343
Vented Vapor Saturation Factor:	0.9923	0.9918	0.9909	0.9899	0.9889	0.9879	0.9876	0.9877	0.9884	0.9898	0.9910	0.9920
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875
Tank Diameter (ft):	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000
Vapor Space Outage (ft):	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333
Tank Shell Height (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Average Liquid Height (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Roof Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Roof Height (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
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
Shell Radius (ft):	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0068	0.0073	0.0081	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0080	0.0072
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg 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
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0332	0.0372	0.0372	0.0380	0.0394	0.0394	0.0402	0.0395	0.0375	0.0407	0.0361	0.0343
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0022	0.0026	0.0028	0.0031	0.0033	0.0036	0.0038	0.0037	0.0033	0.0033	0.0027	0.0024
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0068	0.0073	0.0081	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0080	0.0072
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0058	0.0061	0.0068	0.0077	0.0084	0.0091	0.0093	0.0092	0.0087	0.0076	0.0067	0.0060
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0080	0.0087	0.0096	0.0107	0.0117	0.0127	0.0131	0.0130	0.0120	0.0109	0.0094	0.0084
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9923	0.9918	0.9909	0.9899	0.9889	0.9879	0.9876	0.9877	0.9884	0.9898	0.9910	0.9920
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0068	0.0073	0.0081	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0080	0.0072
Vapor Space Outage (ft):	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333
Working Losses (lb):	319.6706	341.9820	380.0875	424.0227	466.2719	504.7887	517.9336	514.0352	484.3231	427.4561	376.5273	334.8033
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000

Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0068	0.0073	0.0081	0.0091	0.0100	0.0108	0.0111	0.0110	0.0104	0.0091	0.0080	0.0072
Net Throughput (gal/mo.):	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700
Annual Turnovers:	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000
Turnover Factor:	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917
Maximum Liquid Volume (gal):	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864
Maximum Liquid Height (ft):	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000
Tank Diameter (ft):	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	362.1608	387.8004	435.9959	485.2262	537.8545	579.3013	598.3783	592.5742	552.7447	495.6785	428.6592	380.6406

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

100-205 - Vertical Fixed Roof Tank
Galena Park, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	5,091.90	745.11	5,837.01

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	100-207
City:	Galena Park
State:	Texas
Company:	KM LIquids Terminals LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):		50.00
Diameter (ft):		125.00
Liquid Height (ft) :		48.00
Avg. Liquid Height (ft):		30.00
Volume (gallons):		4,406,404.29
Turnovers:		48.00
Net Throughput(gal/yr):		229,133,022.89
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		4.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

100-207 - Vertical Fixed Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	Jan	61.33	56.49	66.17	67.93	0.0088	0.0076	0.0100	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Feb	63.24	57.86	68.61	67.93	0.0093	0.0080	0.0107	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Mar	66.49	61.09	71.90	67.93	0.0101	0.0088	0.0118	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Apr	70.21	64.66	75.75	67.93	0.0111	0.0097	0.0133	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	May	73.22	67.46	78.98	67.93	0.0123	0.0104	0.0146	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Jun	75.96	70.18	81.75	67.93	0.0134	0.0111	0.0160	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Jul	76.90	71.00	82.80	67.93	0.0138	0.0114	0.0167	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Aug	76.62	70.81	82.43	67.93	0.0136	0.0113	0.0165	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Sep	74.50	68.97	80.03	67.93	0.0128	0.0107	0.0150	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Oct	70.45	64.55	76.36	67.93	0.0112	0.0096	0.0135	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Nov	66.19	60.93	71.45	67.93	0.0100	0.0087	0.0116	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Dec	62.62	57.63	67.61	67.93	0.0092	0.0079	0.0104	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

100-207 - Vertical Fixed Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	54.8243	58.2358	69.5404	74.7582	88.1672	92.3869	99.9379	97.5144	84.5403	83.3925	64.9594	58.5304
Vapor Space Volume (cu ft):	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002
Vapor Space Expansion Factor:	0.0332	0.0372	0.0372	0.0380	0.0394	0.0394	0.0403	0.0396	0.0376	0.0407	0.0361	0.0343
Vented Vapor Saturation Factor:	0.9901	0.9896	0.9887	0.9876	0.9863	0.9851	0.9847	0.9848	0.9857	0.9875	0.9888	0.9898
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875	261,799.3875
Tank Diameter (ft):	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000
Vapor Space Outage (ft):	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333
Tank Shell Height (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Average Liquid Height (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Roof Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Roof Height (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
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
Shell Radius (ft):	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000	62.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg 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
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0332	0.0372	0.0372	0.0380	0.0394	0.0394	0.0403	0.0396	0.0376	0.0407	0.0361	0.0343
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0024	0.0027	0.0030	0.0036	0.0042	0.0050	0.0053	0.0051	0.0043	0.0039	0.0028	0.0025
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0076	0.0080	0.0088	0.0097	0.0104	0.0111	0.0114	0.0113	0.0107	0.0096	0.0087	0.0079
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0100	0.0107	0.0118	0.0133	0.0146	0.0160	0.0167	0.0165	0.0150	0.0135	0.0116	0.0104
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9901	0.9896	0.9887	0.9876	0.9863	0.9851	0.9847	0.9848	0.9857	0.9875	0.9888	0.9898
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Vapor Space Outage (ft):	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333	21.3333
Working Losses (lb):	413.2484	435.5598	473.6653	518.5746	574.9069	626.2626	643.7892	638.5914	598.9752	523.1525	470.1051	428.3811
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000

Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Net Throughput (gal/mo.):	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700	19,094,418.5700
Annual Turnovers:	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000
Turnover Factor:	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917
Maximum Liquid Volume (gal):	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864	4,406,404.2864
Maximum Liquid Height (ft):	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000
Tank Diameter (ft):	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000	125.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	468.0727	493.7956	543.2057	593.3329	663.0741	718.6496	743.7271	736.1059	683.5155	606.5450	535.0645	486.9115

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

100-207 - Vertical Fixed Roof Tank
Galena Park, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	6,345.21	926.79	7,272.00

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	1-201	
City:	Galena Park	
State:	Texas	
Company:	KM LIquids Terminals LLC	
Type of Tank:	Vertical Fixed Roof Tank	
Description:		

Tank Dimensions

Shell Height (ft):		16.00
Diameter (ft):		23.00
Liquid Height (ft) :		14.00
Avg. Liquid Height (ft):		10.00
Volume (gallons):		43,511.77
Turnovers:		48.00
Net Throughput(gal/yr):		2,262,612.22
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	

Roof Characteristics

Type:	Cone	
Height (ft)		4.00
Slope (ft/ft) (Cone Roof)		0.35

Breather Vent Settings

Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.03

Meterological Data used in Emissions Calculations: Houston, Texas (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

1-201 - Vertical Fixed Roof Tank
Galena Park, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	Jan	61.33	56.49	66.17	67.93	0.0088	0.0076	0.0100	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Feb	63.24	57.86	68.61	67.93	0.0093	0.0080	0.0107	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Mar	66.49	61.09	71.90	67.93	0.0101	0.0088	0.0118	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Apr	70.21	64.66	75.75	67.93	0.0111	0.0097	0.0133	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	May	73.22	67.46	78.98	67.93	0.0123	0.0104	0.0146	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Jun	75.96	70.18	81.75	67.93	0.0134	0.0111	0.0160	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Jul	76.90	71.00	82.80	67.93	0.0138	0.0114	0.0167	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Aug	76.62	70.81	82.43	67.93	0.0136	0.0113	0.0165	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Sep	74.50	68.97	80.03	67.93	0.0128	0.0107	0.0150	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Oct	70.45	64.55	76.36	67.93	0.0112	0.0096	0.0135	130.0000			162.00	Option 1: VP70 = .011 VP80 = .015
Jet kerosene	Nov	66.19	60.93	71.45	67.93	0.0100	0.0087	0.0116	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Dec	62.62	57.63	67.61	67.93	0.0092	0.0079	0.0104	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

1-201 - Vertical Fixed Roof Tank
Galena Park, Texas

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.6422	0.6824	0.8154	0.8772	1.0354	1.0858	1.1749	1.1463	0.9932	0.9785	0.7616	0.6858
Vapor Space Volume (cu ft):	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002
Vapor Space Expansion Factor:	0.0332	0.0372	0.0372	0.0380	0.0394	0.0394	0.0403	0.0396	0.0376	0.0407	0.0361	0.0343
Vented Vapor Saturation Factor:	0.9966	0.9964	0.9961	0.9957	0.9952	0.9948	0.9947	0.9947	0.9950	0.9957	0.9961	0.9965
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213	3,046.8213
Tank Diameter (ft):	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000
Vapor Space Outage (ft):	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333
Tank Shell Height (ft):	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000	16.0000
Average Liquid Height (ft):	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000	10.0000
Roof Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Roof Outage (Cone Roof)												
Roof Outage (ft):	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333	1.3333
Roof Height (ft):	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Roof Slope (ft/ft):	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500	0.3500
Shell Radius (ft):	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002	0.0002
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Daily Avg. Liquid Surface Temp. (deg. R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Average Ambient Temp. (deg. F):	50.3500	53.9500	60.5500	68.2500	74.5000	80.3500	82.5500	82.2500	78.1500	69.6000	61.0000	53.4500
Ideal Gas Constant R (psia cuft / (lb-mol-deg 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
Liquid Bulk Temperature (deg. R):	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025	527.6025
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	843.3037	1,084.1116	1,347.4457	1,590.4745	1,784.0092	1,910.5999	1,887.1220	1,778.6156	1,545.7394	1,330.3131	973.3844	790.9541
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0332	0.0372	0.0372	0.0380	0.0394	0.0394	0.0403	0.0396	0.0376	0.0407	0.0361	0.0343
Daily Vapor Temperature Range (deg. R):	19.3501	21.5044	21.6058	22.1867	23.0359	23.1345	23.5987	23.2262	22.1177	23.6123	21.0493	19.9649
Daily Vapor Pressure Range (psia):	0.0024	0.0027	0.0030	0.0036	0.0042	0.0050	0.0053	0.0051	0.0043	0.0039	0.0028	0.0025
Breather Vent Press. Setting Range(psia):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0076	0.0080	0.0088	0.0097	0.0104	0.0111	0.0114	0.0113	0.0107	0.0096	0.0087	0.0079
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0100	0.0107	0.0118	0.0133	0.0146	0.0160	0.0167	0.0165	0.0150	0.0135	0.0116	0.0104
Daily Avg. Liquid Surface Temp. (deg R):	520.9988	522.9062	526.1638	529.8782	532.8881	535.6321	536.5686	536.2909	534.1741	530.1228	525.8595	522.2925
Daily Min. Liquid Surface Temp. (deg R):	516.1612	517.5301	520.7624	524.3315	527.1292	529.8485	530.6689	530.4843	528.6447	524.2197	520.5971	517.3012
Daily Max. Liquid Surface Temp. (deg R):	525.8363	528.2823	531.5653	535.4249	538.6471	541.4157	542.4683	542.0974	539.7036	536.0259	531.1218	527.2837
Daily Ambient Temp. Range (deg. R):	21.3000	22.7000	21.1000	20.3000	20.2000	19.5000	20.3000	20.5000	20.5000	24.0000	22.8000	22.5000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9966	0.9964	0.9961	0.9957	0.9952	0.9948	0.9947	0.9947	0.9950	0.9957	0.9961	0.9965
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Vapor Space Outage (ft):	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333	7.3333
Working Losses (lb):	4.0807	4.3010	4.6773	5.1208	5.6770	6.1841	6.3572	6.3059	5.9147	5.1660	4.6421	4.2301
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000

Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0088	0.0093	0.0101	0.0111	0.0123	0.0134	0.0138	0.0136	0.0128	0.0112	0.0100	0.0092
Net Throughput (gal/mo.):	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186	188,551.0186
Annual Turnovers:	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000	48.0000
Turnover Factor:	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917	0.7917
Maximum Liquid Volume (gal):	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735	43,511.7735
Maximum Liquid Height (ft):	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000	14.0000
Tank Diameter (ft):	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000	23.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	4.7229	4.9834	5.4927	5.9979	6.7124	7.2700	7.5321	7.4522	6.9079	6.1445	5.4037	4.9159

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

1-201 - Vertical Fixed Roof Tank
Galena Park, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Jet kerosene	62.66	10.88	73.54

Appendix B

MSS Emission Calculation Details

Table B-1
Maintenance, Startup and Shutdown Emissions Summary (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Equipment Type	Activity Description	Included in Construction Phase	EPN	Emission Rate									
				VOC		NO_x		CO		SO_2		$PM/PM_{10}/PM_{2.5}$	
				lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Heaters	Heater Startup and Shutdown	1	MSS	1.27	0.06	15.28	0.76	69.48	3.47	1.41	0.07	1.75	0.09
		2	MSS	1.27	0.06	15.28	0.76	69.48	3.47	1.41	0.07	1.56	0.08
IFR Storage Tanks	Controlled roof landings	1	MSS	5.20	0.06	0.61	0.14	1.21	0.28	0.00	0.00	0.17	0.04
		2	MSS		0.03		0.00		0.01		0.00		0.00
IFR Storage Tanks	Venting to atosphere post control	1	MSS	66.78	1.31	-	-	-	-	-	-	-	-
		2	MSS		0.65		-		-		-		-
Misc. Piping Components	Equipment venting/degassing emissions	1	MSS	31.92	0.18	3.51	0.07	7.02	0.14	0.01	0.00	0.98	0.02
		2	MSS		0.18		0.07		0.14		0.00		0.02
Misc. Piping Components	Equipment liquid draining emissions	1	MSS	36.57	0.09	-	-	-	-	-	-	-	-
		2	MSS		0.09		-		-		-		-
Misc. Piping Components	Venting to atosphere post control	1	MSS	13.98	0.03	-	-	-	-	-	-	-	-
		2	MSS		0.03		-		-		-		-
Misc. Piping Components	Equipment liquid refilling emissions	1	MSS	11.97	0.03	-	-	-	-	-	-	-	-
		2	MSS		0.03		-		-		-		-
Air Mover & Vacuum Mover	Air Mover & Vacuum Mover	1	MSS	1.83	0.02	0.45	0.05	0.90	0.11	0.00	0.00	0.13	0.01
		2	MSS		0.02		0.05		0.11		0.00		0.01
Frac Tanks	Frac tanks	1	MSS	3.05	0.02	-	-	-	-	-	-	-	-
		2	MSS		0.02		-		-		-		-
Flare	Flare	1	MSS	7.95	0.51	6.14	0.39	22.41	1.43	0.01	0.00	-	-
		2	MSS		0.51		0.39		1.43		0.00		-
Phase I Totals				***180.52***	***2.30***	***25.99***	***1.42***	***101.01***	***5.43***	***1.44***	***0.07***	***3.02***	***0.16***
Phase II Totals				***1.27***	***1.61***	***15.28***	***1.28***	***69.48***	***5.16***	***1.41***	***0.07***	***1.56***	***0.11***
Totals				***181.79***	***3.92***	***41.26***	***2.71***	***170.49***	***10.59***	***2.85***	***0.14***	***4.59***	***0.28***

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-2
Heater MSS Emission Calculations
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Description	Pollutant	Maximum Short-Term CO (ppmv @ 3% O_2)	MSS Event Duration (hrs/yr)	Max Firing Rate (MMBtu/hr)	Maximum F Factor (Fd) (scf/MMBtu)	Emission Factor (short)	Emission Factor Units	Emissions (lb/hr)	Emissions (tpy)
F-101	Naphtha Splitter Reboiler Train I	CO	400	100	130.00	8710	0.296	lb/MMBtu	38.43	1.92
		NO_x					0.065	lb/MMBtu	8.45	0.42
		VOC					0.0054	lb/MMBtu	0.70	0.04
		SO_2					0.006	lb/MMBtu	0.78	0.04
		$PM/PM_{10}/PM_{2.5}$					0.00745	lb/MMBtu	0.97	0.05
F-102	Combi Tower Reboiler Train I	CO	400	100	105	8710	0.296	lb/MMBtu	31.04	1.55
		NO_x					0.065	lb/MMBtu	6.83	0.34
		VOC					0.0054	lb/MMBtu	0.57	0.03
		SO_2					0.006	lb/MMBtu	0.63	0.03
		$PM/PM_{10}/PM_{2.5}$					0.00745	lb/MMBtu	0.78	0.04
F-201	Naphtha Splitter Reboiler Train II	CO	400	100	130.0	8710	0.296	lb/MMBtu	38.43	1.92
		NO_x					0.065	lb/MMBtu	8.45	0.42
		VOC					0.0054	lb/MMBtu	0.70	0.04
		SO_2					0.006	lb/MMBtu	0.78	0.04
		$PM/PM_{10}/PM_{2.5}$					0.00745	lb/MMBtu	0.97	0.05

Table B-2
Heater MSS Emission Calculations
KM Liquids Terminals LLC
Galena Park Terminal

EPN	Description	Pollutant	Maximum Short-Term CO (ppmv @ 3% O_2)	MSS Event Duration (hrs/yr)	Max Firing Rate (MMBtu/hr)	Maximum F Factor (Fd) (scf/MMBtu)	Emission Factor (short)	Emission Factor Units	Emissions (lb/hr)	Emissions (tpy)
F-202	Combi Tower Reboiler Train II	CO	400	100	105.0	8710	0.296	lb/MMBtu	31.04	1.55
		NO_x					0.065	lb/MMBtu	6.83	0.34
		VOC					0.0054	lb/MMBtu	0.57	0.03
		SO_2					0.006	lb/MMBtu	0.63	0.03
		$PM/PM_{10}/PM_{2.5}$					0.00745	lb/MMBtu	0.78	0.04

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-3
MSS Flare Emissions (EPN: FL-101)
KM Liquids Terminals LLC
Galena Park Terminal

Event: **Startup**
Maximum Gas Flow: 25,000 scfh
Event Duration: 500 hrs/yr

Component	Waste Stream										Efficiency	VOC EMISSIONS		LHV	Net Heat Release			Emission Factors		NOX AND CO EMISSIONS			
					Flow						Efficiency	Emissions						lb/MMBTU		NOX		CO	
	MW	Wt %	Mol%	Vol%	lb/hr	lb/yr	scf/hr	MMscf/yr	mol/hr	mol/yr	%	lb/hr	tpy	BTU/scf	BTU/scf	BTU/hr	MMBTU/yr	NOX	CO	lb/hr	tpy	lb/hr	tpy
Nitrogen	28.00	1.76%	1.00%	1.00%	18.47	9,234.83	250.00	0.13	0.66	329.82	0%	18.4697	4.6174	-	-	-	-	0.138	0.0000	0.00	0.00	0.00	0.00
Hydrogen	2.02	3.53%	27.85%	27.85%	37.11	18,554.42	6962.50	3.48	18.37	9,185.36	99%	0.3711	0.0928	269	75	1,872,599	936	0.138	0.0000	0.26	0.06	0.00	0.00
Methane	16.00	56.06%	55.88%	55.88%	589.76	294,881.27	13970.00	6.99	36.86	18,430.08	99%	5.8976	1.4744	892	499	12,465,877	6,233	0.138	0.5496	1.72	0.43	6.85	1.71
Ethane	30.07	12.44%	6.60%	6.60%	130.91	65,455.80	1650.00	0.83	4.35	2,176.78	99%	1.3091	0.3273	1,588	105	2,620,236	1,310	0.138	0.5496	0.36	0.09	1.44	0.36
Ethylene	28.05	2.90%	1.65%	1.65%	30.53	15,264.68	412.50	0.21	1.09	544.20	99%	0.3053	0.0763	1,471	24	606,935	303	0.138	0.5496	0.08	0.02	0.33	0.08
Propane	44.09	10.59%	3.83%	3.83%	111.39	55,696.69	957.50	0.48	2.53	1,263.19	99%	1.1139	0.2785	2,273	87	2,176,602	1,088	0.138	0.5496	0.30	0.08	1.20	0.30
Propylene	42.00	1.13%	0.43%	0.43%	11.91	5,956.46	107.50	0.05	0.28	141.82	99%	0.1191	0.0298	2,142	9	230,265	115	0.138	0.5496	0.03	0.01	0.13	0.03
n-Butane	58.12	4.66%	1.28%	1.28%	49.07	24,535.30	320.00	0.16	0.84	422.16	98%	0.9814	0.2454	2,957	38	946,240	473	0.138	0.5496	0.13	0.03	0.52	0.13
Butenes	56.10	0.56%	0.16%	0.16%	5.92	2,960.42	40.00	0.02	0.11	52.77	98%	0.1184	0.0296	2,828	5	113,120	57	0.138	0.5496	0.02	0.00	0.06	0.02
1,3-Butadiene	54.09	0.47%	0.14%	0.14%	5.00	2,497.56	35.00	0.02	0.09	46.17	98%	0.0999	0.0250	2,828	4	98,980	49	0.138	0.5496	0.01	0.00	0.05	0.01
n-Pentane	72.14	0.81%	0.18%	0.18%	8.57	4,282.96	45.00	0.02	0.12	59.37	98%	0.1713	0.0428	3,609	6	162,405	81	0.138	0.5496	0.02	0.01	0.09	0.02
n-Pentene	70.13	0.09%	0.02%	0.02%	0.93	462.60	5.00	0.00	0.01	6.60	98%	0.0185	0.0046	3,609	1	18,045	9	0.138	0.5496	0.00	0.00	0.01	0.00
Isopentane	72.15	0.09%	0.02%	0.02%	0.95	475.92	5.00	0.00	0.01	6.60	98%	0.0190	0.0048	3,602	1	18,010	9	0.138	0.5496	0.00	0.00	0.01	0.00
Cyclohexane	84.16	1.85%	0.35%	0.35%	19.43	9,715.04	87.50	0.04	0.23	115.44	98%	0.3886	0.0972	4,287	15	375,113	188	0.138	0.5496	0.05	0.01	0.21	0.05
Hexane (C6+)	86.17	0.59%	0.11%	0.11%	6.25	3,126.22	27.50	0.01	0.07	36.28	98%	0.1250	0.0313	4,287	5	117,893	59	0.138	0.5496	0.02	0.00	0.06	0.02
Benzene	78.11	2.45%	0.50%	0.50%	25.76	12,880.94	125.00	0.06	0.33	164.91	98%	0.5152	0.1288	3,525	18	440,625	220	0.138	0.5496	0.06	0.02	0.24	0.06
Ammonia	17.03	0.00%	0.00%	0.00%	0.03	0.31	0.70	0.00	0.00	0.02	98%	0.0006	0.0000	45	0	32	0	0.138	0.5496	0.00	0.00	0.00	0.00
Hydrogen Sulfide	34.08	0.00%	0.00%	0.00%	0.00	0.65	0.04	0.00	0.00	0.02	98%	0.0001	0.0000	596	0	24	0	0.138	0.5496	0.00	0.00	0.00	0.00
Sulfur Dioxide	64.00	0.00%	0.00%	0.00%	-	-	-	-	-	-	0%	0.0069	0.0006	-	-	-	-	0.0000	0.0000	0.00	0.00	0.00	0.00
TOTAL		100.00%	100.00%	100.00%	1,052.00	525,982.07	25,000.74	12.50	65.97	32,981.57		3.9758	0.9940		891	22,263,000	11,131			3.07	0.77	11.21	2.80

totals are VOC only

Event: **Shutdown**
Maximum Gas Flow: 25,000 scfh
Event Duration: 500 hrs/yr

Component	Waste Stream										Efficiency	VOC EMISSIONS		LHV	Net Heat Release			Emission Factors		NOX AND CO EMISSIONS			
					Flow						Efficiency	Emissions						lb/MMBTU		NOX		CO	
	MW	Wt %	Mol%	Vol%	lb/hr	lb/yr	scf/hr	MMscf/yr	mol/hr	mol/yr	%	lb/hr	tpy	BTU/scf	BTU/scf	BTU/hr	MMBTU/yr	NOX	CO	lb/hr	tpy	lb/hr	tpy
Nitrogen	28.00	1.76%	1.00%	1.00%	18.47	184.70	250.00	0.00	0.66	6.60	0%	18.4697	0.0923	-	-	-	-	0.138	0.0000	0.00	0.00	0.00	0.00
Hydrogen	2.02	3.53%	27.85%	27.85%	37.11	371.09	6962.50	0.07	18.37	183.71	99%	0.3711	0.0019	269	75	1,872,599	19	0.138	0.0000	0.26	0.00	0.00	0.00
Methane	16.00	56.06%	55.88%	55.88%	589.76	5,897.63	13970.00	0.14	36.86	368.60	99%	5.8976	0.0295	892	499	12,465,877	125	0.138	0.5496	1.72	0.01	6.85	0.03
Ethane	30.07	12.44%	6.60%	6.60%	130.91	1,309.12	1650.00	0.02	4.35	43.54	99%	1.3091	0.0065	1,588	105	2,620,236	26	0.138	0.5496	0.36	0.00	1.44	0.01
Ethylene	28.05	2.90%	1.65%	1.65%	30.53	305.29	412.50	0.00	1.09	10.88	99%	0.3053	0.0015	1,471	24	606,935	6	0.138	0.5496	0.08	0.00	0.33	0.00
Propane	44.09	10.59%	3.83%	3.83%	111.39	1,113.93	957.50	0.01	2.53	25.26	99%	1.1139	0.0056	2,273	87	2,176,602	22	0.138	0.5496	0.30	0.00	1.20	0.01
Propylene	42.00	1.13%	0.43%	0.43%	11.91	119.13	107.50	0.00	0.28	2.84	99%	0.1191	0.0006	2,142	9	230,265	2	0.138	0.5496	0.03	0.00	0.13	0.00
n-Butane	58.12	4.66%	1.28%	1.28%	49.07	490.71	320.00	0.00	0.84	8.44	98%	0.9814	0.0049	2,957	38	946,240	9	0.138	0.5496	0.13	0.00	0.52	0.00
Butenes	56.10	0.56%	0.16%	0.16%	5.92	59.21	40.00	0.00	0.11	1.06	98%	0.1184	0.0006	2,828	5	113,120	1	0.138	0.5496	0.02	0.00	0.06	0.00
1,3-Butadiene	54.09	0.47%	0.14%	0.14%	5.00	49.95	35.00	0.00	0.09	0.92	98%	0.0999	0.0005	2,828	4	98,980	1	0.138	0.5496	0.01	0.00	0.05	0.00
n-Pentane	72.14	0.81%	0.18%	0.18%	8.57	85.66	45.00	0.00	0.12	1.19	98%	0.1713	0.0009	3,609	6	162,405	2	0.138	0.5496	0.02	0.00	0.09	0.00
n-Pentene	70.13	0.09%	0.02%	0.02%	0.93	9.25	5.00	0.00	0.01	0.13	98%	0.0185	0.0001	3,609	1	18,045	0	0.138	0.5496	0.00	0.00	0.01	0.00
Isopentane	72.15	0.09%	0.02%	0.02%	0.95	9.52	5.00	0.00	0.01	0.13	98%	0.0190	0.0001	3,602	1	18,010	0	0.138	0.5496	0.00	0.00	0.01	0.00
Cyclohexane	84.16	1.85%	0.35%	0.35%	19.43	194.30	87.50	0.00	0.23	2.31	98%	0.3886	0.0019	4,287	15	375,113	4	0.138	0.5496	0.05	0.00	0.21	0.00
Hexane	86.17	0.59%	0.11%	0.11%	6.25	62.52	27.50	0.00	0.07	0.73	98%	0.1250	0.0006	4,287	5	117,893	1	0.138	0.5496	0.02	0.00	0.06	0.00
Benzene	78.11	2.45%	0.50%	0.50%	25.76	257.62	125.00	0.00	0.33	3.30	98%	0.5152	0.0026	3,525	18	440,625	4	0.138	0.5496	0.06	0.00	0.24	0.00
Ammonia	17.03	0.00%	0.00%	0.00%	0.03	0.31	0.70	0.00	0.00	0.02	98%	0.0006	0.0000	45	0	32	0	0.138	0.5496	0.00	0.00	0.00	0.00
Hydrogen Sulfide	34.08	0.00%	0.00%	0.00%	0.00	0.04	0.04	0.00	0.00	0.00	98%	0.0001	0.0000	596	0	24	0	0.138	0.5496	0.00	0.00	0.00	0.00
Sulfur Dioxide	64.00	0.00%	0.00%	0.00%	-	-	-	0.00	-	-	0%	0.0069	0.0000	-	-	-	-	0.000	0.000	0.00	0.00	0.00	0.00
TOTAL		100.00%	100.00%	100.00%	1,052.00	10,519.97	25,000.74	0.25	65.97	659.65		3.9758	0.0199		891	22,263,000	223			3.07	0.02	11.21	0.06

totals are VOC only

Notes:
1. The VOC speciation and flow rates utlized in the emission calculations are based on typical compositions and flows that may vary based on process conditions.
2. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-4
Controlled IFR Tank Roof Landing MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Constants

Date Roof Landed		07/01/11	
Date Drained Dry or Roof Floated		07/04/11	
Number of Days Roof Off-Float	n_d	3.00	(days)
Atmospheric Pressure	Pa	14.70	(psia)
Max Daily Ambient Temperature	T_{MAX}	92.70	(deg F)
Min Daily Ambient Temperature	T_{MIN}	72.40	(deg F)
Daily Total Solar Insulation Factor	I	1887.12	[BTU/(ft2*day)]
Daily Average Ambient Temperature	T_{AA}	542.15	(deg R)
Control Device Efficiency		99.00%	

Tank ID	Included in Construction Phase	Dia.	High Roof Leg Height	Status Prior to Re-Filling (1)	Height of Liquid Heel	Product Stored (2)	RVP	Molecular Weight	Stock Liquid Density	Slope of ASTM Distillation Curve	Height of Vapor Space	Volume of Vapor Space	Tank Solar Absorptance Factor	Daily Vapor Temp. Range	Liquid Bulk Temp.	Daily Average Liquid Surface Temp.
		D			H_{le}			M_V	W_l	S	h_V	V_V	alpha	delta T	T_B	T_{LA}
		(ft)	(ft)		(ft)			(lb/lb-mol)	(lb/gal)		(ft)	(ft^3)		(deg R)	(deg R)	(deg R)
200-201	1	174	5.00	Drain	0.001	Feed Stock	13	66	5.6	3.5	5.00	118,869.80	0.17	23.60	542.17	544.70
200-202	1	174	5.00	Drain	0.001	Feed Stock	13	66	5.6	3.5	5.00	118,869.80	0.17	23.60	542.17	544.70
200-203	2	174	5.00	Drain	0.001	Feed Stock	13	66	5.6	3.5	5.00	118,869.80	0.17	23.60	542.17	544.70
100-201	1	123	5.00	Drain	0.001	Light Naphtha	13	66	5.6	3.5	5.00	59,399.56	0.17	23.60	542.17	544.70
100-202	1	123	5.00	Drain	0.001	Light Naphtha	13	66	5.6	3.5	5.00	59,399.56	0.17	23.60	542.17	544.70
100-209	2	123	5.00	Drain	0.001	Light Naphtha	13	66	5.6	3.5	5.00	59,399.56	0.17	23.60	542.17	544.70
100-203	1	123	5.00	Drain	0.001	Heavy Naphtha	7	66	5.6	2.5	5.00	59,399.56	0.17	23.60	542.17	544.70
100-204	1	123	5.00	Drain	0.001	Heavy Naphtha	7	66	5.6	2.5	5.00	59,399.56	0.17	23.60	542.17	544.70
100-210	2	123	5.00	Drain	0.001	Heavy Naphtha	7	66	5.6	2.5	5.00	59,399.56	0.17	23.60	542.17	544.70
5-201	1	41	5.00	Drain	0.001	Wastewater	13	66	5.6	3.5	5.00	6,599.95	0.17	23.60	542.17	544.70

Tank ID	Antoine's Equation Constant	Antoine's Equation Constant	True Vapor Pressure of Stock Liquid	Vapor Space Expansion Factor	Standing Idle Saturation Factor	Not to Exceed Standing Idle Losses	Calculated Standing Idle Losses	Uncontrolled Standing Idle Losses	Controlled Standing Idle Losses	Controlled Standing Idle Losses	Uncontrolled Filling Losses	Controlled Filling Losses	Filling Pump-in Rate	Controlled Filling VOC Emission Rate	Emissions Total Controlled	MSS Roof Landings (3)	Emissions Total Uncontrolled
	A	B	P	K_E	K_s		L_s				L_F	L_F					
			(psia)			(lbs)	(lbs)	(lbs)	(lbs)	(lbs/hr)	(lbs)	(lbs)	(bbls/hr)	(lb/hr)	(lbs/ event)	(events/year)	(tpy)
200-201	11.50	4962.83	10.93	0.62	0.26	8,806.01	838.91	838.91	8.39	0.70	2,201.50	22.02	5,000	5.19	30.40	1	**0.02**
200-202	11.50	4962.83	10.93	0.62	0.26	8,806.01	838.91	838.91	8.39	0.70	2,201.50	22.02	5,000	5.19	30.40	1	**0.02**
200-203	11.50	4962.83	10.93	0.62	0.26	8,806.01	838.91	838.91	8.39	0.70	2,201.50	22.02	5,001	5.20	30.40	1	**0.02**
100-201	11.50	4962.83	10.93	0.62	0.26	4,400.39	419.21	419.21	4.19	0.35	1,100.10	11.00	5,000	5.19	15.19	1	**0.01**
100-202	11.50	4962.83	10.93	0.62	0.26	4,400.39	419.21	419.21	4.19	0.35	1,100.10	11.00	5,000	5.19	15.19	1	**0.01**
100-209	11.50	4962.83	10.93	0.62	0.26	4,400.39	419.21	419.21	4.19	0.35	1,100.10	11.00	5,001	5.20	15.19	1	**0.01**
100-203	12.02	5605.16	5.62	0.18	0.40	2,261.28	419.21	419.21	4.19	0.35	565.32	5.65	5,000	2.67	9.85	1	**0.00**
100-204	12.02	5605.16	5.62	0.18	0.40	2,261.28	419.21	419.21	4.19	0.35	565.32	5.65	5,000	2.67	9.85	1	**0.00**
100-210	12.02	5605.16	5.62	0.18	0.40	2,261.28	419.21	419.21	4.19	0.35	565.32	5.65	5,001	2.67	9.85	1	**0.00**
5-201	11.50	4962.83	10.93	0.62	0.26	488.93	46.58	46.58	0.47	0.04	122.23	1.22	5,000	1.22	1.69	1	**0.00**
															Phase I Totals	***7***	***0.06***
															Phase II Totals	***3***	***0.03***

Notes
1. Codes for tank status before re-fill: Full Heel (FULL) Partial Heel (PARTIAL) Drain Dry (DRAIN)
2. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-5

Controlled Tank Roof Landing MSS Emissions (EPN: MSS)

KM Liquids Terminals LLC

Galena Park Terminal

Basis

Used NO_x and CO emissions factor from TCEQ's Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers, October 2002.
Used SO_2 and PM factors from AP-42, Section 3.2-7.

Operation Type	Source	Hourly - Phase I and II		Annual - Phase I		Annual - Phase II	
		Vapors lb/hr	Heat Release MMBtu/hr	Vapors lb/yr	Heat Release MMBtu/yr	Vapors lb/yr	Heat Release MMBtu/yr
Tank Roof Landing Events	Controlled Roof Landings	519.60	3.90	11,257.30	84.43	5,544.25	41.58

Operation Type	Pollutant	Emissions Factor		Hourly Emissions Phase I and II	Annual Emissions Phase I	Annual Emissions Phase II
		(Value)	(Units)	(lb/hr)	(ton/yr)	(ton/yr)
Tank Roof Landing Events	VOC	99%	DRE	5.20	0.06	0.03
	NO_x	0.1380	lb/MMBtu	0.54	0.01	0.00
	CO	0.2755	lb/MMBtu	1.07	0.01	0.01
	SO_2	0.0006	lb/MMBtu	0.002	0.00	0.00
	$PM/PM_{10}/PM_{2.5}$	0.0384	lb/MMBtu	0.15	0.00	0.00

Pilot/Assist Gas Emissions

Total natural gas combusted (Annual Emissions)= 8.0 scfm = 8.5 cfm
Total natural gas combusted (Short-Term Emissions)= 8.0 scfm = 8.5 cfm
based on 68 F & 100 F standard and actual temperature, respectively.
Natural gas heating value = 1020 btu/scf, based on LHV

Pollutant	Emission factor		Total Gas Flow		Operating Hours	Emissions	
	(Value)	(Units)	scfh (maximum)	scfh (average)	(hrs/yr)	(lb/hr)	(tons/yr)
NO_X	0.1380	lb/MMBtu	480	480	4,000	0.07	0.14
CO	0.2755	lb/MMBtu	480	480	4,000	0.13	0.27
SO_2	0.0006	lb/MMbtu	480	480	4,000	0.00	0.00
$PM/PM_{10}/PM_{2.5}$	0.0384	lb/MMbtu	480	480	4,000	0.02	0.04

Notes:

1. Controlled roof landings include those associated with product inventory control and maintenance, startup, and shutdown activities.
2. Annual pilot and assist gas emissions are included in the Phase I emissions total.

3 The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Updated 2/22/2012

Table B-6
Uncontrolled Tank Venting and Forced Ventilation MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Annual Tank Degassing Events Per Tank	1
Turnovers Required	4
Initial Saturation Factor	0.60
Post Degass Liquid Surface Area of Tank Floor, %	80
Forced Ventilation Air Flow Rate, cfm	3,000
Forced Ventilation Duration, hrs	168

Emissions Summary	**lb/hr**	**tpy**
Tank Venting to Atmosphere Post Control	66.78	1.31

Tank ID		**200-201**	**200-202**	**200-203**	**100-201**	**100-202**	**100-209**	**100-203**	**100-204**	**100-210**	**5-201**	**100-205**	**100-206**	**100-211**	**100-207**	**100-208**	**100-212**	**1-201**
Included in Construction Phase		1	1	2	1	1	2	1	1	2	1	1	1	2	1	1	2	1
Tank Type	IFR/EFR/FXD/PRS	IFR	IFR	IFR	IFR	IFR	IFR	IFR	IFR	IFR	IFR	FXD	FXD	FXD	FXD	FXD	FXD	FXD
Molecular Weight of Vapor	lb/lb-mole	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00	66.00
Max. Liquid Surface Temp.	°R	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77	544.77
Product Vapor Pressure at Max. Liquid Storage Temp.	psi	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Tank Landing or Roof Height	ft	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00	50.00	50.00	50.00	50.00	50.00	16.00
Diameter	ft	174.00	174.00	174.00	123.00	123.00	123.00	123.00	123.00	123.00	41.00	125.00	125.00	125.00	125.00	125.00	125.00	23.00
Landed Volume	ft^3	118,894	118,894	118,894	59,411	59,411	59,411	59,411	59,411	59,411	6,601	613,592	613,592	613,592	613,592	613,592	613,592	6,648
Tank Venting to Atmosphere Post Control																		
Vented VOC Emissions after Control (5,000 ppm)	lbs/event	103.52	103.52	103.52	51.73	51.73	51.73	51.73	51.73	51.73	5.75	534.26	534.26	534.26	534.26	534.26	534.26	5.79
Tank Venting Duration	hrs	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Vented VOC Emissions after Control	lb/hr	4.31	4.31	4.31	2.16	2.16	2.16	2.16	2.16	2.16	0.24	22.26	22.26	22.26	22.26	22.26	22.26	0.24
Vented VOC Emissions after Control	tpy	0.05	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.00	0.27	0.27	0.27	0.27	0.27	0.27	0.00

Degass Emissions after Control
Ec = 0.005 * VL/379 Mwm
Where:
Ec = Emissions vented to atmosphere after controlled degassing (lb)
VL = Volume of vapor space when the roof is landed (ft3)
Mwm = Molecular weight of methane (16 lbs/mole)
0.01 = Factor used since tank is purged to 10,000 ppmv

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

2. The proposed short-term cap contributions are based on three events occuring simultaneously.

Table B-6
Uncontrolled Tank Venting and Forced Ventilation MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Annual Tank Degassing Events Per Tank	1
Turnovers Required	4
Initial Saturation Factor	0.60
Post Degass Liquid Surface Area of Tank Floor, %	80
Forced Ventilation Air Flow Rate, cfm	3,000
Forced Ventilation Duration, hrs	168

Emissions Summary	**lb/hr**
Tank Venting to Atmosphere Post Control	66.78

Tank ID		**B5-201**	**B5-202**	**B5-203**	**B5-204**	**B5-205**	**B5-206**	**B5-207**	***Emission Totals Phase I***	***Emission Totals Phase II***
Included in Construction Phase		1	1	1	1	1	2	2		
Tank Type	IFR/EFR/FXD/PRS	PRS	PRS	PRS	PRS	PRS	PRS	PRS		
Molecular Weight of Vapor	lb/lb-mole	66.00	66.00	66.00	66.00	66.00	66.00	66.00		
Max. Liquid Surface Temp.	°R	544.77	544.77	544.77	544.77	544.77	544.77	544.77		
Product Vapor Pressure at Max. Liquid Storage Temp.	psi	11.00	11.00	11.00	11.00	11.00	11.00	11.00		
Tank Landing or Roof Height	ft	75.00	75.00	75.00	75.00	75.00	75.00	75.00		
Diameter	ft	15.00	15.00	15.00	15.00	15.00	15.00	15.00		
Landed Volume	ft^3	13,254	13,254	13,254	13,254	13,254	13,254	13,254		
Tank Venting to Atmosphere Post Control										
Vented VOC Emissions after Control (5,000 ppm)	lbs/event	11.54	11.54	11.54	11.54	11.54	11.54	11.54		
Tank Venting Duration	hrs	24.0	24.0	24.0	24.0	24.0	24.0	24.0		
Vented VOC Emissions after Control	lb/hr	0.48	0.48	0.48	0.48	0.48	0.48	0.48	***66.78***	
Vented VOC Emissions after Control	tpy	0.01	0.01	0.01	0.01	0.01	0.01	0.01	***1.31***	***0.65***

Degass Emissions after Control

Ec = 0.005 * VL/379 Mwm

Where:

Ec = Emissions vented to atmosphere after controlled degassing (lb)

VL = Volume of vapor space when the roof is landed (ft3)

Mwm = Molecular weight of methane (16 lbs/mole)

0.01 = Factor used since tank is purged to 10,000 ppmv

Notes:

1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

2. The proposed short-term cap contributions are based on three events occuring simultaneously.

Table B-7
Equipment Venting MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Emissions Summary	lb/hr	tpy
Equipment MSS Vapors Vented (See Table 9 for controlled emissions details)	31.92	0.37
Equipment MSS Liquid Draining	36.57	0.17
Equipment MSS Venting to Atmosphere Post Control	13.98	0.07
Equipment Refilling	11.97	0.06

Equipment ID		PUMP	FILTER/METER/VAVLE	VESSELS AND PIPING	EMMISSION TOTALS
Annual Venting/Draining/Refilling Events	events/yr	20	20	10	
Short-Term Venting/Draining/Refilling Events	simultaneous events	3	3	1	
Molecular Weight of Vapor	lb/lb-mole	66	66	66	
Daily Avg. Liquid Surface Temp.	°R	544.77	544.77	544.77	
Vapor Pressure at Max. Storage Temp.	psia	11.00	11.00	11.00	
Volume	ft^3/event	85.00	85.00	15,550.88	
Equipment MSS Vapors Vented (See Table B-8 for controlled emission details)					
Vented to Control	Yes/No	Yes	Yes	Yes	
Moles	M_v/event	0.160	0.160	29.264	
Vented VOC Emissions	lbs/hr	0.32	0.32	19.31	***19.95***
Total Venting VOC Emissions	tpy	0.11	0.11	0.10	***0.31***
Equipment MSS Liquid Draining					
Equipment Draining VOC Loading Loss	lbs/1,000 gals loaded	9.96	9.96	9.96	
Equipment Draining VOC Loading Loss (20% of pump, filer, meter, and valve volume and 2.5% of piping volume)	lbs/event	1.27	1.27	28.97	
Equipment Draining VOC Loading Loss	lbs/hr	3.80	3.80	28.97	***36.57***
Equipment Draining VOC Loading Loss	tpy	0.01	0.01	0.14	***0.17***
Equipment MSS Venting (Volume > 10 ft3) to Atmosphere Post Control					
Vented VOC Emissions after Control (5,000 ppm)	lbs/event	0.07	0.07	13.54	
Venting Duration	hrs	1.0	1.0	1.0	
Vented VOC Emissions after Control (5,000 ppm)	lb/hr	0.22	0.22	13.54	***13.98***
Total Venting VOC Emissions	tpy	0.001	0.001	0.068	***0.069***
Equipment MSS Refilling					
Vented to Control	Yes/No	Yes	Yes	Yes	
Equipment VOC Loading Loss	lbs/1,000 gals loaded	9.96	9.96	9.96	
Recovery VOC Loading Loss	lbs/event	0.06	0.06	11.59	
Recovery VOC Loading Loss	lbs/hr	0.19	0.19	11.59	***11.97***
Recovery VOC Loading Loss	tpy	0.00	0.00	0.06	***0.06***

Venting Emissions after Control

$Ec = 0.005 * V_L/379\ M_{wm}$

Where:

Ec = Emissions vented to atmosphere after controlled degassing (lb)

V_L = Equipment volume (ft^3)

M_{wm} = Molecular weight (lbs/mole)

Notes:

1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-8

Controlled LDAR Equipment MSS Emissions (EPN: MSS)

KM Liquids Terminals LLC

Galena Park Terminal

Basis

Used NO_x and CO emissions factor from TCEQ's Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers, October 2002.
Used SO_2 and PM factors from AP-42, Section 3.2-7.

Operation Type	Source	Hourly		Annual	
		Vapors lb/hr	Heat Release MMBtu/hr	Vapors lb/yr	Heat Release MMBtu/yr
MSS	Equipment Venting	3,191.71	23.94	73,385.56	550.39
Totals		***3,191.71***	***23.94***	***73,385.56***	***550.39***

Operation Type	Pollutant	Emissions Factor		Emissions	
		(Value)	(Units)	(lb/hr)	(ton/yr)
MSS	VOC	99%	DRE	31.92	0.37
	NO_x	0.1380	lb/MMBtu	3.30	0.04
	CO	0.2755	lb/MMBtu	6.59	0.08
	SO_2	0.0006	lb/MMBtu	0.01	0.00016
	$PM/PM_{10}/PM_{2.5}$	0.0384	lb/MMBtu	0.92	0.011

Pilot/Assist Gas Emissions

Total natural gas combusted (Annual Emissions)= 25.0 scfm = 26.5 cfm
Total natural gas combusted (Short-Term Emissions)= 25.0 scfm = 26.5 cfm
based on 68 F & 100 F standard and actual temperature, respectively.
Natural gas heating value = 1020 btu/scf, based on LHV

Pollutant	Emission factor		Total Gas Flow		Operating Hours	Emissions	
	(Value)	(Units)	scfh (maximum)	scfh (average)	(hrs/yr)	(lb/hr)	(tons/yr)
NO_X	0.1380	lb/MMBtu	1,500	1,500	1,000	0.21	0.11
CO	0.2755	lb/MMBtu	1,500	1,500	1,000	0.42	0.21
SO_2	0.0006	lb/MMbtu	1,500	1,500	1,000	0.00	0.00
$PM/PM_{10}/PM_{2.5}$	0.0384	lb/MMbtu	1,500	1,500	1,000	0.06	0.03

Notes:

1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Updated 2/22/2012

Table B-9
Air Mover and VacuumTruck MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Basis - Air Mover & Vacuum Mover (Control & No Control)
Emissions calculated based on loading loss equation (Equation 1, AP-42, Section 5.2)
Saturation factor assumed to be 1.45, splash loading.
Volume of vapor displaced is two times the volume of liquid transferred. This is to account for the vacuum hose sucking air during part of the transfer.
Includes vacuum trucks that utilize a "vacuum pump" to collect material. Controls (i.e., carbon, thermal, scrubber, or etc.) will be utilized for materials with a vp > 0.5 psia.
Volume of vapor displaced for carbon control is two times the volume of the liquid transferred at 100 ppmv breakthrough.

Basis - Vacuum Mover (Empty Vacuum)
The vacuum truck volume is 3,486 gals (466 ft^3).
Saturation factor assumed to be 0.6, submerged loading.

TRUCK TYPE AND LOAD METHOD	MATERIAL	Vapor MW	VP		LOADING LOSS		THROUGHPUT				CONTROL (%)	VACUUM TRUCK EMISSIONS (EPN: MSS) lb/hr		TPY	
Air Mover& Vacuum Mover - Thermal Control	High Vapor Pressure Products	66	11	psia	1020.18	lb/1000bbl	85	bbl/hr	1,275	bbl/yr	99%	1.73	lb/hr	0.01	tpy
Air Mover& Vacuum Mover - Carbon Control	High Vapor Pressure Products	66	11	psia	NA	lb/1000bbl	85	bbl/hr	1,275	bbl/yr	100 ppm	0.93	lb/hr	0.01	tpy
Air Mover & Vacuum Mover - Thermal Control	Low Vapor Pressure Products	130	0.5	psia	91.34	lb/1000bbl	85	bbl/hr	1,275	bbl/yr	99%	0.16	lb/hr	0.00	tpy
Air Mover & Vacuum Mover - Carbon Control	Low Vapor Pressure Products	130	0.5	psia	NA	lb/1000bbl	85	bbl/hr	1,275	bbl/yr	100 ppm	1.83	lb/hr	0.01	tpy
											Totals	***1.83***	***lb/hr***	***0.03***	***tpy***

Notes:
1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-10

Controlled Vacuum Truck MSS Emissions (EPN: MSS)

KM Liquids Terminals LLC

Galena Park Terminal

Basis

Used NO_x and CO emissions factor from TCEQ's Air Permit Technical Guidance for Chemical Sources: Flares and Oxidizers, October 2002.
Vapors generated from products with a vapor pressure < 0.5 psia are not controlled by a thermal control device.

Operation Type	Source	Hourly		Annual	
		Vapors lb/hr	Heat Release MMBtu/hr	Vapors lb/yr	Heat Release MMBtu/yr
MSS	Vacuum Truck	173.43	1.73	2,834.38	21.26
Totals		***173.43***	***1.73***	***2,834.38***	***21.26***

Operation Type	Pollutant	Emissions Factor		Emissions	
		(Value)	(Units)	(lb/hr)	(ton/yr)
MSS	VOC	99%	DRE	1.73	0.01
	NO_x	0.1380	lb/MMBtu	0.24	0.00
	CO	0.2755	lb/MMBtu	0.48	0.00
	SO_2	0.0006	lb/MMBtu	0.00	0.00
	$PM/PM_{10}/PM_{2.5}$	0.0384	lb/MMBtu	0.07	0.00

Pilot/Assist Gas Emissions

Total natural gas combusted (Annual Emissions)= 25.0 scfm = 26.5 cfm
Total natural gas combusted (Short-Term Emissions)= 25.0 scfm = 26.5 cfm
based on 68 F & 100 F standard and actual temperature, respectively.
Natural gas heating value = 1020 btu/scf, based on LHV

Pollutant	Emission factor		Total Gas Flow		Operating Hours	Emissions	
	(Value)	(Units)	scfh (maximum)	scfh (average)	(hrs/yr)	(lb/hr)	(tons/yr)
NO_X	0.1380	lb/MMBtu	1,500	1,500	1,000	0.21	0.11
CO	0.2755	lb/MMBtu	1,500	1,500	1,000	0.42	0.21
SO_2	0.0006	lb/MMBtu	1,500	1,500	1,000	0.00	0.00
$PM/PM_{10}/PM_{2.5}$	0.0384	lb/MMbtu	1,500	1,500	1,000	0.06	0.03

Notes:

1. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Table B-11
Frac Tank MSS Emissions (EPN: MSS)
KM Liquids Terminals LLC
Galena Park Terminal

Filling Basis
Emissions calculated based on loading loss factors (Tables 5.2-1, AP-42, Section 5.2).
Saturation factor assumed to be 0.6, tank truck submerged loading dedicated service.

PRODUCT	LOAD TYPE	MW	MAX VP	LOADING LOSS FACTOR		SHORT-TERM THROUGHPUT (bbl/hr)		ANNUAL THROUGHPUT (bbl/yr)		WORKING EMISSIONS LBS/HR (5 tanks)		WORKING EMISSIONS TPY (50 tanks)	
Misc. Process Liquids	Submerged Load	66	11	10.0511	lb/1000 gal	714	bbl/hr	7,143	bbl/yr	3.02	lbs/hr	0.02	tpy
									Totals	***3.02***	***lbs/hr***	***0.02***	***tpy***

Sample Equation for Filling Emissions (tpy)
$L_{L\ (lbs/Mgal)}$ = 12.46 SPM/T
(12.46) x (0.6) x (5.2) x (62) / (460 + 80) = 4.4634 lb/Mgal
(4.4634 lb/Mgal) / (1000 gal/Mgal) x (10,714 bbl/yr x 42 gals/bbl) x (1-0.99) = 0.02 tpy

Breathing Emissions

Tank Data	
Shell Length (ft)	46.67
Diameter (ft)	8.75
Volume (gallons)	18,000
Turnovers:	1
Net Throughput (gal/yr)	18,000
Max Filling rate (gal/hr)	3,000

Emissions per Frac Tank

Tank	Contents	Maximum Breathing Loss (lb/month) (1)
Frac Tank	Misc. Process Liquids	230.46

Short-Term Breathing Emissions

Number of idle tanks per hour:	10	tanks
Control Efficiency:	99	%
Breathing Emissions per hour (2):	**0.03**	**lbs**
Breathing Emissions per yr (3):	0.02	tpy

Annual Breathing and Working Emissions

Number of Tanks/year:	17	tanks
Control Efficiency:	99	%
Total Annual Emissions (4):	**0.03**	**tons**

Notes:
1. Based on Tanks 4.0 monthly printout.
2. Breathing lb/hr = maximum breathing loss (lb/mo) / 720 hr/mo x number of idle tanks/hour
3. For cap calculation purposes, assumed each frac tank will be in service for thirty days.
4. Total tpy = annual emissions (tpy) x number of tanks/yr
5. The MSS emission calculations included in this permit application are for cap calculation purposes only. These emission calculations are not to be considered enforceable representations as to the magnitude, duration, and/or frequency of individual activities.

Appendix C

RACT/BACT/LAER Clearinghouse Search Tables

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS -FIRED ANNEALING FURNACE (LA43) (MULTIPLE EMISSION POINTS)	NATURAL GAS	196.4	MMBTU/H	NOx	UNLB WITH EGR	0.06	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED BATCH ANNEALING FURNACES (LA63, LA64)	NATURAL GAS	33.4	MMBTU each	NOx	UNLB WITH EGR	0.11	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED PASSIVE ANNEALING FURNACE (LO41)	NATURAL GAS	27.2	MMBTU/H	NOx	ULTRA LOW NOX BURNERS (ULNB) WITH EXHAUST GAS RECIRCULATION	0.11	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED PASSIVE ANNEALING FURNACE (LO41)	NATURAL GAS	27.2	MMBTU/H	NOx	ULTRA LOW NOX BURNERS (ULNB) WITH EXHAUST GAS RECIRCULATION (EGR)	0.11	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	NATURAL GAS	169	MMBTU/H	NOx	ULTRA LOW NOX AND LOW NOX BURNERS	0.085	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	NATURAL GAS	169	MMBTU/H	NOx	UNLB WITH EGR	0.11	LB/MMBTU	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED REHEAT FURNACE (LA21) (MULTIPLE EMISSION POINTS)	NATURAL GAS	169	MMBTU/H	NOx	SCR	100	PPMVD	BACT-PSD
AL-0230	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	THYSSENKRUPP STEEL AND STAINLESS USA, LLC	AL	08/17/2007 ACT	NATURAL GAS-FIRED BATCH ANNEALING FURNACE (535)	NATURAL GAS	99	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.11	LB/MMBTU	BACT-PSD
AL-0242	TUSCALOOSA REFINERY	HUNT REFINING COMPANY	AL	05/20/2008 ACT	EIGHT (8) PROCESS HEATERS	REFINERY GAS			NOx	NEXT GENERATION ULTRA-LOW NOX BURNERS.	0.035	LB/MMBTU	BACT-PSD
AL-0246	TUSCALOOSA	HUNT REFINERY CO.	AL	09/28/2009 ACT	NINE PROCESS HEATERS IN FOUR PROCESS UNITS	REFINERY GAS			NOx	NEXT GENERATION ULTRA-LOW NOX BURNERS (NGULNB)	0.025	LB/MMBTU	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	NO. 4 ATMOSPHERIC FURNACE, SN-804	NATURAL OR NSPS J QUALITY GAS	280	MMBTU/H	NOx	EXISTING NEXT GENERATION ULTRA LOW NOX BURNERS	0.045	LB/MMBTU	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	NEW NO. 4 VACUUM FURNACE, SN-805N	NATURAL OR NSPS SUBPART J QUALITY GAS	142.2	MMBTU/H	NOx	NEXT GENERATION ULTRA LOW NOX BURNERS	0.035	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	25	MMBTU/H	NOx	LOW NOX BURNERS	0.033	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER SPLITTER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	117	MMBTU/H	NOx	LOW NOX BURNERS	0.032	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT CHARGE HEATER	REFINERY FUEL GAS AND NATURAL GAS	122	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 1	REFINERY FUEL GAS AND NATURAL GAS	192	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 2	REFINERY FUEL GAS OR NATURAL GAS	129	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT DEBUTANIZER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	23.2	MMBTU/H	NOx	LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	311	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR INTERHEATER	REFINERY FULE GAS OR NATURAL GAS	328	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	VACUUM CRUDE CHARGE HEATER	REFINERY FUEL GAS OR NG	101	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT CHARGE HEATER	REFINERY FUEL GAS OR NG	70	MMBTU/H	NOx	LOW NOX BURNERS	0.034	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT MAIN FRACTIONATOR HEATER	REFINERY FUEL GAS OR NG	211	MMBTU/H	NOx	LOW-NOX BURNERS	0.025	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	NAPHTHA HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NG	21.4	MMBTU/H	NOx	LOW-NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT ISOSTRIPPER REBOILER	REFINERY FUEL GAS AND NATURAL GAS	222	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	ATMOSPHERIC CRUDE CHARGE HEATER	NATURAL GAS OR REFINERY FUEL GAS	346	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROGEN REFORMER HEATER	REFINERY FUEL GAS OR NATURAL GAS	1435	MMBTU/H	NOx	LOW NOX BURNERS AND SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	SPRAY DRYER HEATER	REFINERY FUEL GAS OR NATURAL GAS	44	MMBTU/H	NOx	LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DELAYED COKING UNIT CHARGE HEATER NOS. 1 AND 2	REFINERY FUEL GAS OR NATURAL GAS	99.5	MMBTU/H	NOx	LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
CA-1121	CHEVRON PRODUCTS CO.	CHEVRON PRODUCTS CO.	CA	07/22/2003 ACT	HEATER-OTHER PROCESS	REFINERY GAS	0		NOx	LOW NOX BURNER/SCR SYSTEM	5	PPMVD@3%O2	BACT-PSD
DE-0020	VALERO DELAWARE CITY REFINERY	VALERO ENERGY CORP	DE	02/26/2010 ACT	CRUDE UNIT ATMOSPHERIC HEATER 21-H-701	REFINERY FUEL GAS			NOx	SCR	0.04	LB/MMBTU	RACT
DE-0020	VALERO DELAWARE CITY REFINERY	VALERO ENERGY CORP	DE	02/26/2010 ACT	CRUDE UNIT VACUUM HEATER 21-H-2	REFINERY FUEL GAS	240	MMBTU/H	NOx	SCR	0.04	LB/MMBTU	RACT
IA-0095	TATE & LYLE INDGREDIENTS AMERICAS, INC.		IA	09/19/2008 ACT	BIOGAS/ NATURAL GAS BOILER AND FIBER DRYER PROCESS HEATERS	BIOGAS			NOx	LOW NOX BURNERS AND FLUE GAS RECIRCULATION	0.04	LB/MMBTU	BACT-PSD
ID-0017	POWER COUNTY ADVANCED ENERGY CENTER	SOUTHEAST IDAHO ENERGY, LLC	ID	02/10/2009 ACT	GASIFIER HEATERS (2), 25 MMBTU/H, SRC14 & SRC15	NAT GAS	25	MMBTU/H	NOx	GOOD COMBUSTION PRACTICES.	0		BACT-PSD
ID-0017	POWER COUNTY ADVANCED ENERGY CENTER	SOUTHEAST IDAHO ENERGY, LLC	ID	02/10/2009 ACT	ASU REGEN HEATER, 0.1 MMBTU/H, SRC13	NAT GAS	0.1	MMBTU/H	NOx	GOOD COMBUSTION PRACTICES	0		BACT-PSD
LA-0121	CONVENT REFINERY	MOTIVA ENTERPRISES LLC	LA	05/17/2002 ACT	H-OIL TRANSPORT HEATER		21	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.84	LB/H	BACT-PSD
LA-0121	CONVENT REFINERY	MOTIVA ENTERPRISES LLC	LA	05/17/2002 ACT	H-OIL ATM. TOWER HEATER		29.4	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	1.18	LB/H	BACT-PSD
LA-0121	CONVENT REFINERY	MOTIVA ENTERPRISES LLC	LA	05/17/2002 ACT	HDS-1 HEATER	FUEL GAS	140	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	5.6	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	FRACTIONATOR FURNACE		360	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS	14.4	LB/H	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	HYDROFINER FURNACE 1		150	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS.	6	LB/H	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	HYDROFINER FURNACE 2		197	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS.	7.88	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER F-72-703	REFINERY FUEL GAS	528	MMBTU/H	NOx	LOW NOX BURNER	41.7	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01A		46	MMBTU/H	NOx	LOW NOX BURNERS	6.4	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01B		46	MMBTU/H	NOx	LOW NOX BURNERS	3.8	LB/H	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER REACTOR CHARGE HEATER (5-08), KHT REACTOR CHARGE HEATER (9-08), & HCU TRAIN 1&2 REACTOR CHARGE HEATERS (11-08 & 12-08)	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS (ULNB) WITHOUT AIR PREHEAT	0.03	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER STRIPPER REBOILER HEATER (6-08) & KHT STRIPPER REBOILER HEATER (10-08)	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS (ULNB) WITHOUT AIR PREHEAT	0.03	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B CRUDE HEATERS (1-08 & 2-08) & COKER CHARGE HEATER (15-08)	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS (ULNB) AND SELECTIVE CATALYTIC REDUCTION (SCR VOLUNTARY)	0.0125	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	PLATFORMER HEATER CELLS NO. 1-3 (7A-08, 7B-08, & 7C-08) & HCU FRACTIONATOR HEATER (13-08)	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS (ULNB) WITHOUT AIR PREHEAT	0.03	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B VACUUM TOWER HEATERS (3-08 & 4-08)	REFINERY FUEL GAS	155.2	MMBTU/H EA.	NOx	ULTRA LOW NOX BURNERS (ULNB) AND SELECTIVE CATALYTIC REDUCTION (SCR VOLUNTARY)	0.0125	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	THERMAL DRYING UNIT HEATEC HEATER (124-1-91)	REFINERY FUEL GAS	9.6	MM BTU/H	NOx		0.43	MAX LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS/REBOILERS	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS	0.04	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (2008-1 - 2008-9)	PROCESS FUEL GAS			NOx	ULTRA LOW NOX BURNERS	0.04	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (94-21 & 94-29)	REFINERY FUEL GAS			NOx	LOW NOX BURNERS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	CPF HEATER H-39-03 & H-39-02 (94-28 & 94-30)	REFINERY FUEL GAS			NOx	LOW NOX BURNERS	0.05	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	DHT HEATERS (4-81, 5-81)	REFINERY FUEL GAS	70	MMBTU/H EA	NOx	LOW NOX BURNERS	0.08	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATER F-72-703 (7-81)	REFINERY FUEL GAS	633	MMBTU/H	NOx	LOW NOX BURNERS	0.08	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0245	HYDROGEN PLANT	VALERO REFINING - NEW ORLEANS, LLC	LA	12/15/2010 ACT	SMR Heaters (EQT0400 and EQT0401)	Fuel Gas	1055	MMBTU/H	NOx	Ultra low NOX burner in combination with SCR	0.015	LB/MMBTU	BACT-PSD
MS-0086	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	05/08/2007 ACT	FOUR PLATFORMER FEED/INTERSTAGE HEATER WITH A COMMON STACK	REFINERY FUEL GAS	850	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS	38.25	LB/H	BACT-PSD
MS-0086	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	05/08/2007 ACT	REFORMATE SPLITTER FURNACE	REFINERY FUEL GAS	160	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS	7.2	LB/H	BACT-PSD
MS-0089	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	04/14/2009 ACT	HYDROFINER FEED FURNACE (BK-261)	REFINERY FUEL GAS	70	MMBTU/H	NOx	LOW NOX BURNERS	6.3	LB/H	BACT-PSD
MS-0089	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	04/14/2009 ACT	IDW/HDF REACTOR FEED HEATER (CK-005)	REFINERY FUEL GAS	54.53	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	2.45	LB/H	BACT-PSD
MS-0089	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	04/14/2009 ACT	IDW/HDF VACUUM COLUMN FEED HEATER (CK-006)	REFINERY FUEL GAS	51.05	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	2.3	LB/H	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	CRUDE HEATER	REFINERY FUEL GAS	165	MMBTU/H	NOx	NEXT GENERATION ULNB WITH AIR PREHEATER	0.039	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	VACUUM HEATER	REFINERY FUEL GAS	58	MMBTU/H	NOx	NEXT GENERATION ULNB WITH AIR PREHEATER	0.039	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	NO. 1 H2 HEATER	REFINERY FUEL GAS/ PSA GAS	266	MMBTU/H	NOx	ULNB	0.03	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	NO. 2 H2 HEATER	REFINERY FUEL GAS / PSA GAS	215	MMBTU/H	NOx	ULNB	0.03	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER FRACTIONATOR FURNACE	REFINERY FUEL GAS	9.6	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER REBOILER	REFINERY FUEL GAS	35	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	SULFUR RECOVERY HOT OIL HEATER	REFINERY FUEL GAS	9.6	MMBTU	NOx	ULTRA LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STEAM METHANE REFORMER HEATER	NATURAL GAS AND REFORMER OFF-GAS	337	MMBTU/H	NOx	SELECTIVE CATALYTIC REDUCTION	0.0125	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	ROSE 2 HOT OIL HEATER	REFINERY FUEL GAS	120	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
OH-0329	BP-HUSKY REFINING LLC	BP PRODUCTS, NORTH AMERICA INC.	OH	08/07/2009 ACT	REFORMER HEATER	REFINERY FUEL GAS	519	MMBTU/H	NOx		23.4	LB/H	N/A
OK-0089	TPI PETROLEUM INC., VALERO ARDMORE REFINERY	TPI PETROLEUM INC.	OK	06/09/2003 ACT	CRUDE UNIT HEATER, H-102A		145	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.045	LB/MMBTU	BACT-PSD
OK-0089	TPI PETROLEUM INC., VALERO ARDMORE REFINERY	TPI PETROLEUM INC.	OK	06/09/2003 ACT	CRUDE UNIT HEATER, H-102B		135	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.059	LB/MMBTU	BACT-PSD
OK-0092	VALERO ARDMORE REFINERY	TPI PETROLEUM	OK	01/13/2003 ACT	CRUDE OIL HEATER - UNIT 102A	FUEL OIL	145	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.045	LB/MMBTU	BACT-PSD
OK-0092	VALERO ARDMORE REFINERY	TPI PETROLEUM	OK	01/13/2003 ACT	CRUDE OIL HEATER - UNIT 102B	FUEL OIL	135	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.059	LB/MMBTU	BACT-PSD
OK-0098	PONCA CITY REF	CONOCOPHILLIPS PONCA CITY REFINERY	OK	03/31/2004 ACT	CRUDE VACUUM UNIT, HEATER H-0016	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS	3.73	LB/H	BACT-PSD
OK-0098	PONCA CITY REF	CONOCOPHILLIPS PONCA CITY REFINERY	OK	03/31/2004 ACT	CRUDE CHARGE UNIT, HEATER H-0001	REFINERY FUEL GAS			NOx	ULTRA LOW NOX BURNERS	8.75	LB/H	BACT-PSD
OK-0126	SUNOCO INC TULSA REFINERY	SUNOCO INC	OK	05/27/2008 ACT	PROCESS HEATER	REFINERY FUEL GAS	44	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS	0.03	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
OK-0126	SUNOCO INC TULSA REFINERY	SUNOCO INC	OK	05/27/2008 ACT	PROCESS HEATER	REFINERY FUEL GAS/NATURAL GAS	53.7	MMBTU/H	NOx	ULTRA LOW-NOX BURNERS	0.03	LB/MMBTU	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-1 NEW NAPTHA SPLITTER REBOILER	REFINERY GAS	131.3	MMBTU/H	NOx	ULTRA-LOW NOX BURNERS; 0.03 LB/MMBTU.	3.94	LB/H	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-3 NEW NO. 4 CTU VACUUM HEATER	REFINERY GAS	45	MMBTU/H	NOx	ULTRA-LOW NOX BURNERS. 0.03 LB/MMBTU	1.39	LB/H	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-4 NEW NO. 4 CTU CRUDE HEATER	REFINERY GAS	125	MMBTU/H	NOx	ULTRA-LOW NOX BURNERS. 0.03 LB/MMBTU	3.75	LB/H	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-5 NEW NO. 1 CTU TAR STRIPPER HEATER	REFINERY GAS	98	MMBTU/H	NOx	ULTRA-LOW NOX BURNERS. 0.03 LB/MMBTU	2.94	LB/H	BACT-PSD
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	DELAYED COKER UNIT, HEATER	REFINERY GAS	116	MMBTU/H	NOx	LOW NOX BURNERS	4.04	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	FCC FEED HYDROTREATER HEATER	REFINERY GAS	91	MMBTU/H	NOx	LOW NOX BURNERS, GOOD COMBUSTION PRACTICE	1.82	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	NORTH CRUDE HEATER	REFINERY GAS	147	MMBTU/H	NOx	LOW NOX BURNERS	6.68	LB/H	Other Case-by-Case
PA-0243	CONOCOPHILLIPS COMPANY	CONOCOPHILLIPS COMPANY	PA	10/01/2004 ACT	544 VACUUM HEATER				NOx		0.06	MMBTU/H	BACT-PSD
PA-0252	SUNOCO, INC. (R&M)	SUNOCO, INC. (R&M)	PA	12/04/2006 ACT	433 H-1 HEATER	REFINERY FUEL GAS	260	MMBTU/H	NOx		0.035	LB/MMBTU	BACT-PSD
PA-0256	SUNOCO, INC. (R&M)	SUNOCO, INC. (R&M)	PA	01/29/2008 ACT	1H-5 HEATER	REFINERY FUEL GAS	98	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.02	LBS/MMBTU	LAER
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, ECU, NO. 2 NORTH & SOUTH	NATURAL GAS	166.5	MMBTU/H	NOx		0.05	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	NHDS NO. 1 CHARGE HEATER	NATURAL GAS	42.2	MMBTU/H	NOx		0.073	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, ALKY UNIT ISO-STRIPPER REBOILER	NATURAL GAS	166.5	MMBTU/H	NOx		0.05	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	CCR STABILIZATION REBOILER	NATURAL GAS	54	MMBTU/H	NOx		0.06	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	WCR HEATER		209	MMBTU/H	NOx		0.03	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, ISOM ADSORBER	NATURAL GAS	9.1	MMBTU/H	NOx		0.14	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, CCR REACTOR	NATURAL GAS	500	MMBTU/H	NOx		0.6	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, (5)	NATURAL GAS	50	MMBTU/H	NOx		0.03	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FIRED UNITS				NOx		883	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	CRU HEATER				NOx		0.07	LB/MMBTU	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU- NO.3 REACTOR FEED HEATER		58.95	MMBTU/H	NOx	SCR	2.1	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.4 REACTOR FEED HEATER		49	MMBTU/H	NOx	SCR	1.8	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-REFORMATE STABILIZER REBOILER		54.77	MMBTU/H	NOx	SCR	2	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II WEST REACTOR FEED HEATER		104.25	MMBTU/H	NOx	SCR	3.8	LB/H	Other Case-by-Case

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II COMBINATION SPLITTER HEATER		77.62	MMBTU/H	NOx	SCR	2.8	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II XYLENE RERUN TOWER HEATER		83.7	MMBTU/H	NOx	SCR	3	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II EAST REACTOR FEED HEATER		75	MMBTU/H	NOx	SCR	2.7	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE I HEATER		96.23	MMBTU/H	NOx	SCR	3.5	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE II HEATER		226.42	MMBTU/H	NOx	SCR	8.2	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO. 1 REACTOR FEED HEATER		121.74	MMBTU/H	NOx	SCR	4.4	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.2 REACTOR FEED HEATER		69.68	MMBTU/H	NOx	SCR	2.5	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-1 DIESEL HDS HEATER	FUEL GAS			NOx		3.6	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-2 DIESEL HDS HEATER	FUEL GAS			NOx		2.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	7-H-2 DELAYED COKER CHARGE HEATER	FUEL GAS			NOx		5.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-3 #4 VACUUM CHARGE HEATER	FUEL GAS			NOx		3.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-4 #4 CRUDE CHARGE HEATER	FUEL GAS			NOx		6.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-5 #4 VACUUM CHARGE HEATER	FUEL GAS			NOx		3.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-6 #4 CRUDE CHARGE HEATER				NOx		9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	12-H-1 FCCU RAW OIL CHARGE HEATER	FUEL GAS			NOx		2.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	17-H-1 ALKY. ISO. STRIPPER REBOILER	FUEL GAS			NOx		2.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-1 KTX. CLAR TWR. CHARGE HEATER	FUEL GAS			NOx		1.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-2 TETRAMER SPL. REB. HTR.	FUEL GAS			NOx		1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-1 KERO. HDS CHARGE HEATER, 38-H-2KEROSENE HDS HEATER, 39-H-1 #4 HC CHARGE HEATER	FUEL GAS			NOx		4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-2 KERO HDS FRAC REBOILER	FUEL GAS			NOx		1.6	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for NOx Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	38-H-1 KEROSENE HDS CHARGE HEATER	FUEL GAS			NOx		3.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-2 #4 HC STRIPPER REBOILER				NOx		3.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-7	FUEL GAS			NOx		2.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-4A/B	FUEL GAS			NOx		4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 #2 REFORMER HDS CHARGER AND STRIPPER	FUEL GAS			NOx		3.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q10-H-1 SMR HEATER	FUEL GAS			NOx		8.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q11-H-301 HCU RX CHARGE	FUEL GAS			NOx		1.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 FRACTIONATOR AND Q11-H-3001,3002 HCU DEBUT. REB. AND FRACT. REB.	FUEL GAS			NOx		2.6	LB/H	BACT-PSD
TX-0451	DIAMOND SHAMROCK REFINING VALERO	DIAMOND SHAMROCK REFINING COMPANY LP	TX	05/20/2004 ACT	COMBUSTION UNITS, TANKS, PROCESS VENTS, LOADING, FLARES, FUGITIVES (4), WASTEWATER, COOLING TOWERS				NOx		341.98	LB/H	BACT-PSD
TX-0576	PIPE MANUFACTURING STEEL MINI MILL	TPCO AMERICA INC	TX	04/19/2010 ACT	Rolling mill furnaces	natural gas	428	MMBTU/H	NOx	good combustion practice	0.1863	LB/MMBTU	BACT-PSD
TX-0580	MCKEE REFINERY HYDROGEN PRODUCTION UNIT	DIAMOND SHAMROCK REFINING COMPANY L.P.A VALERO COM	TX	12/30/2010 ACT	Hydrogen Production Unit Furnace	Refinery gas (PSA purge gas) w/NG	355.65	MMBTU/H	NOx	Furnace has low NOx burners followed by Selective catalytic Reduction (SCR) to achieve NOx emission limit of 0.01 lb NOx/MMBtu (annual basis) and 0.015 lb/MMBtu on hourly basis.	0.01	LB/MMBTU	OTHER CASE-BY-CASE
WA-0294	FERNDALE REFINERY	CONOCO PHILLIPS 66 COMPANY	WA	06/17/2005 ACT	CAT GASOLINE DESULFURIZER FEED HEATER	REFINERY GAS	40	MMBTU/H	NOx	LOW NOX BURNER	10	PPMDV @ 7% O2	BACT-PSD
WA-0295	FERNDALE REFINERY	PHILLIPS 66 COMPANY	WA	06/05/2002 ACT	CATALYTIC GASOLINE DESULFURIZER FEED HEATER	REFINERY GAS	17500	BBL/D	NOx	ULTRA LOW NOX BURNERS	17	PPMDV @ 7% O2	BACT-PSD
WA-0301	BP CHERRY POINT REFINERY	BRITISH PETROLEUM	WA	04/20/2005 ACT	PROCESS HEATER, IHT	NATURAL GAS	13	MMBTU/H	NOx	ULTRA LOW NOX BURNERS	0.1	LB/MMBTU	BACT-PSD
WA-0324	FERNDALE REFINERY	CONOCOPHILLIPS REFINING COMPANY	WA	06/15/2005 ACT	CGD FEED HEATER (MODEL ID SRC19)	NATURAL GAS			NOx	ULTRALOW LOW NOX BURNER	17	PPMDV	BACT-PSD

Table C-1 Heater RBLC Search Results for NH3 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT CHARGE HEATER	REFINERY FUEL GAS AND NATURAL GAS	122	MMBTU/H	NH3		5	PPMVD	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 1	REFINERY FUEL GAS AND NATURAL GAS	192	MMBTU/H	NH3		5	PPMVD	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 2	REFINERY FUEL GAS OR NATURAL GAS	129	MMBTU/H	NH3		5	PPMVD	
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	311	MMBTU/H	NH3		5	PPMVD	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR INTERHEATER	REFINERY FULE GAS OR NATURAL GAS	328	MMBTU/H	NH3		5	PPMVD	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	VACUUM CRUDE CHARGE HEATER	REFINERY FUEL GAS OR NG	101	MMBTU/H	NH3		5	PPMVD	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT ISOSTRIPPER REBOILER	REFINERY FUEL GAS AND NATURAL GAS	222	MMBTU/H	NH3		5	PPMVD	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	ATMOSPHERIC CRUDE CHARGE HEATER	NATURAL GAS OR REFINERY FUEL GAS	346	MMBTU/H	NH3		5	PPMVD @ 0% OXYGEN	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROGEN REFORMER HEATER	REFINERY FUEL GAS OR NATURAL GAS	1435	MMBTU/H	NH3		5	PPMVD	BACT-PSD
CA-1121	CHEVRON PRODUCTS CO.	CHEVRON PRODUCTS CO.	CA	07/22/2003 ACT	HEATER-OTHER PROCESS	REFINERY GAS	0		NH3	LOW NOX BURNER/SCR SYSTEM	5	PPMVD@3%O2	BACT-PSD
DE-0020	VALERO DELAWARE CITY REFINERY	VALERO ENERGY CORP	DE	02/26/2010 ACT	CRUDE UNIT ATMOSPHERIC HEATER 21-H-701	REFINERY FUEL GAS			NH3	AMMONIA SLIP FROM SCR	10	PPMVD @ 3% O2	RACT
DE-0020	VALERO DELAWARE CITY REFINERY	VALERO ENERGY CORP	DE	02/26/2010 ACT	CRUDE UNIT VACUUM HEATER 21-H-2	REFINERY FUEL GAS	240	MMBTU/H	NH3	AMMONIA SLIP FROM SCR	10	PPMVD @ 3% O2	RACT
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STEAM METHANE REFORMER HEATER	NATURAL GAS AND REFORMER OFF-GAS	337	MMBTU/H	NH3	SELECTIVE CATALYTIC REDUCTION	7	PPMV (WET)	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU- NO.3 REACTOR FEED HEATER		58.95	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM.	0.24	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.4 REACTOR FEED HEATER		49	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.2	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-REFORMATE STABILIZER REBOILER		54.77	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM.	0.22	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II WEST REACTOR FEED HEATER		104.25	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.42	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II COMBINATION SPLITTER HEATER		77.62	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.32	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II XYLENE RERUN TOWER HEATER		83.7	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.34	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II EAST REACTOR FEED HEATER		75	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.31	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE I HEATER		96.23	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM.	0.39	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE II HEATER		226.42	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.92	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO. 1 REACTOR FEED HEATER		121.74	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM	0.5	LB/H	Other Case-by-Case
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.2 REACTOR FEED HEATER		69.68	MMBTU/H	NH3	LEAK DETECTION AND REPAIR PROGRAM.	0.28	LB/H	Other Case-by-Case

Table C-1 Heater RBLC Search Results for NH3 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0580	MCKEE REFINERY HYDROGEN PRODUCTION UNIT	DIAMOND SHAMROCK REFINING COMPANY L.P.A VALERO COM	TX	12/30/2010 ACT	Hydrogen Production Unit Furnace	Refinery gas (PSA purge gas) w/NG	355.65	MMBTU/H	NH3	Audio, Visual and allfactory inspections for ammonia is included in the permit. Ammonia slippage from SCR is limited to 10 ppmv at 3% oxygen.	10	PPMV	OTHER CASE-BY-CASE

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	NO. 4 ATMOSPHERIC FURNACE, SN-804	NATURAL OR NSPS J QUALITY GAS	280	MMBTU/H	CO	GOOD COMBUSTION PRACTICE	0.04	LB/MMBTU	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	NEW NO. 4 VACUUM FURNACE, SN-805N	NATURAL OR NSPS SUBPART J QUALITY GAS	142.2	MMBTU/H	CO	GOOD COMBUSTION PRACTICE	0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	25	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER SPLITTER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	117	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT CHARGE HEATER	REFINERY FUEL GAS AND NATURAL GAS	122	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 1	REFINERY FUEL GAS AND NATURAL GAS	192	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 2	REFINERY FUEL GAS OR NATURAL GAS	129	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT DEBUTANIZER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	23.2	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	311	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR INTERHEATER	REFINERY FULE GAS OR NATURAL GAS	328	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	VACUUM CRUDE CHARGE HEATER	REFINERY FUEL GAS OR NG	101	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT CHARGE HEATER	REFINERY FUEL GAS OR NG	70	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT MAIN FRACTIONATOR HEATER	REFINERY FUEL GAS OR NG	211	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	NAPHTHA HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NG	21.4	MMBTU/H	CO		0.04	LB/MMBTU	
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT ISOSTRIPPER REBOILER	REFINERY FUEL GAS AND NATURAL GAS	222	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	ATMOSPHERIC CRUDE CHARGE HEATER	NATURAL GAS OR REFINERY FUEL GAS	346	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROGEN REFORMER HEATER	REFINERY FUEL GAS OR NATURAL GAS	1435	MMBTU/H	CO		0.01	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	SPRAY DRYER HEATER	REFINERY FUEL GAS OR NATURAL GAS	44	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DELAYED COKING UNIT CHARGE HEATER NOS. 1 AND 2	REFINERY FUEL GAS OR NATURAL GAS	99.5	MMBTU/H	CO		0.04	LB/MMBTU	BACT-PSD
CA-1121	CHEVRON PRODUCTS CO.	CHEVRON PRODUCTS CO.	CA	07/22/2003 ACT	HEATER-OTHER PROCESS	REFINERY GAS	0		CO	LOW NOX BURNER/SCR SYSTEM	10	PPMVD@3%O2	BACT-PSD
IL-0103	CONOCOPHILLIPS WOOD RIVER REFINERY	CONOCOPHILLIPS	IL	08/05/2008 ACT	NEW AND MODIFIED HEATERS (7 NEW, 1 MODIFIED)	REFINERY FUEL GAS		MMBTU/H	CO	GOOD COMBUSTION PRACTICES.	0.02	LB/MMBTU	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER F-72-703	REFINERY FUEL GAS	528	MMBTU/H	CO	GOOD DESIGN/OPERATION/COMBUSTION PRACTICES	21.5	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01A		46	MMBTU/H	CO	GOOD DESIGN/OPERATION/ COMBUSTION PRACTICES	1.6	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01B		46	MMBTU/H	CO	GOOD DESIGN/ OPERATION/ COMBUSTION PRACTICES	2.8	LB/H	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	PIPESTILL, COKER, HYDROCRACKING, & LIGHT ENDS FURNACES				CO	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.082	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	PIPESTILL, COKER, CAT COMPLEX, & LIGHT ENDS FURNACES				CO	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.082	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	REFORMING, HYDROFINING, & HEAVY CAT FURNACES				CO	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.082	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	FEED PREPARATION FURNACES F-30 & F-31		352	MMBTU/H	CO	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.082	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	POWERFORMING & LIGHT ENDS FURNACES				CO	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.082	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	POWERFORMING 2 & EAST LIGHT ENDS FURNACES				CO	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.082	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER REACTOR CHARGE HEATER (5-08), KHT REACTOR CHARGE HEATER (9-08), & HCU TRAIN 1&2 REACTOR CHARGE HEATERS (11-08 & 12-08)	REFINERY FUEL GAS			CO	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.04	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER STRIPPER REBOILER HEATER (6-08) & KHT STRIPPER REBOILER HEATER (10-08)	REFINERY FUEL GAS			CO	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.04	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B CRUDE HEATERS (1-08 & 2-08) & COKER CHARGE HEATER (15-08)	REFINERY FUEL GAS			CO	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.04	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	PLATFORMER HEATER CELLS NO. 1-3 (7A-08, 7B-08, & 7C-08) & HCU FRACTIONATOR HEATER (13-08)	REFINERY FUEL GAS			CO	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.04	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B VACUUM TOWER HEATERS (3-08 & 4-08)	REFINERY FUEL GAS	155.2	MMBTU/H EA.	CO	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.04	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	THERMAL DRYING UNIT HEATEC HEATER (124-1-91)	REFINERY FUEL GAS	9.6	MM BTU/H	CO		0.56	MAX LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS/REBOILERS	REFINERY FUEL GAS			CO	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0.08	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (2008-1 - 2008-9)	PROCESS FUEL GAS			CO	COMPLY WITH 40 CFR 60 SUBPARTS NNN AND RRR	0.08	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (94-21 & 94-29)	REFINERY FUEL GAS			CO	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	CPF HEATER H-39-03 & H-39-02 (94-28 & 94-30)	REFINERY FUEL GAS			CO	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0.08	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	DHT HEATERS (4-81, 5-81)	REFINERY FUEL GAS	70	MMBTU/H EA	CO	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATER F-72-703 (7-81)	REFINERY FUEL GAS	633	MMBTU/H	CO	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0.08	LB/MMBTU	BACT-PSD
LA-0238	ALLIANCE REFINERY	CONOCOPHILLIPS COMPANY	LA	07/10/2009 ACT	FCCU FEED HEATER	REFINERY GAS	181.7	MMBTU/H	CO	EQUIPPED WITH VORTOMETRIC HIGH INTENSITY COMBUSTION UNIT	0.55	LB/H	BACT-PSD
LA-0245	HYDROGEN PLANT	VALERO REFINING - NEW ORLEANS, LLC	LA	12/15/2010 ACT	SMR Heaters (EQT0400 and EQT0401)	Fuel Gas	1055	MMBTU/H	CO	Proper equipment designs and operations, good combustion practices	0.08	LB/MMBTU	BACT-PSD
MS-0086	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	05/08/2007 ACT	FOUR PLATFORMER FEED/INTERSTAGE HEATER WITH A COMMON STACK	REFINERY FUEL GAS	850	MMBTU/H	CO		132.6	LB/H	BACT-PSD
MS-0086	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	05/08/2007 ACT	REFORMATE SPLITTER FURNACE	REFINERY FUEL GAS	160	MMBTU/H	CO		24.96	LB/H	BACT-PSD
MS-0089	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	04/14/2009 ACT	HYDROFINER FEED FURNACE (BK-261)	REFINERY FUEL GAS	70	MMBTU/H	CO	LOW NOX BURNERS	8.65	LB/H	BACT-PSD
MS-0089	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	04/14/2009 ACT	IDW/HDF REACTOR FEED HEATER (CK-005)	REFINERY FUEL GAS	54.53	MMBTU/H	CO	ULTRA LOW NOX BURNERS	3.02	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
MS-0089	CHEVRON PRODUCTS COMPANY, PASCAGOULA REFINERY	CHEVRON PRODUCTS COMPANY	MS	04/14/2009 ACT	IDW/HDF VACUUM COLUMN FEED HEATER (CK-006)	REFINERY FUEL GAS	51.05	MMBTU/H	CO	ULTRA LOW NOX BURNERS	2.83	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER FRACTIONATOR FURNACE	REFINERY FUEL GAS	9.6	MMBTU/H	CO	GOOD COMBUSTION PRACTICES	0.09	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER REBOILER	REFINERY FUEL GAS	35	MMBTU/H	CO	GOOD COMBUSTION PRACTICES	0.09	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	SULFUR RECOVERY HOT OIL HEATER	REFINERY FUEL GAS	9.6	MMBTU	CO	GOOD COMBUSTION PRACTICES	0		BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STEAM METHANE REFORMER HEATER	NATURAL GAS AND REFORMER OFF-GAS	337	MMBTU/H	CO	GASEOUS FUEL COMBUSTION ONLY	0.06	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	ROSE 2 HOT OIL HEATER	REFINERY FUEL GAS	120	MMBTU/H	CO	GASEOUS FUEL COMBUSTION ONLY	0.06	LB/MMBTU	BACT-PSD
OH-0329	BP-HUSKY REFINING LLC	BP PRODUCTS, NORTH AMERICA INC.	OH	08/07/2009 ACT	REFORMER HEATER	REFINERY FUEL GAS	519	MMBTU/H	CO		18.6	LB/H	Other Case-by-Case
OK-0102	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	08/18/2004 ACT	PROCESS HEATERS AND BOILERS	REFINERY FUEL GAS			CO	ULTRA LOW NOX BURNERS REQUIRED BY CONSENT DECREE, BACT IS GOOD COMBUSTION PRACTICE.	0.04	LB/MMBTU	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-1 NEW NAPTHA SPLITTER REBOILER	REFINERY GAS	131.3	MMBTU/H	CO	ULTRA-LOW NOX BURNERS; GOOD COMBUSTION PRACTICE. 0.04 LB/MMBTU.	5.25	LB/H	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-3 NEW NO. 4 CTU VACUUM HEATER	REFINERY GAS	45	MMBTU/H	CO	ULTRA-LOW NOX BURNERS; GOOD COMBUSTION PRACTICE. 0.04 LB/MMBTU	1.8	LB/H	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-4 NEW NO. 4 CTU CRUDE HEATER	REFINERY GAS	125	MMBTU/H	CO	ULTRA-LOW NOX BURNERS; GOOD COMBUSTION PRACTICE. 0.04 LB/MMBTU	5	LB/H	BACT-PSD
OK-0136	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	02/09/2009 ACT	NH-5 NEW NO. 1 CTU TAR STRIPPER HEATER	REFINERY GAS	98	MMBTU/H	CO	ULTRA-LOW NOX BURNERS; GOOD COMBUSTION PRACTICE. 0.04 LB/MMBTU	3.92	LB/H	BACT-PSD
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	DELAYED COKER UNIT, HEATER	REFINERY GAS	116	MMBTU/H	CO	GOOD COMBUSTION PRACTICE	8.28	LB/H	BACT-PSD
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	FCC FEED HYDROTREATER HEATER	REFINERY GAS	91	MMBTU/H	CO	GOOD COMBUSTION PRACTICE	7.46	LB/H	BACT-PSD
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	NORTH CRUDE HEATER	REFINERY GAS	147	MMBTU/H	CO	BACT AND BAT REMAIN AS GOOD COMBUSTION PRACTICES	9.27	LB/H	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, ECU, NO. 2 NORTH & SOUTH	NATURAL GAS	166.5	MMBTU/H	CO		0.01	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	NHDS NO. 1 CHARGE HEATER	NATURAL GAS	42.2	MMBTU/H	CO		0.01	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, ALKY UNIT ISO-STRIPPER REBOILER	NATURAL GAS	166.5	MMBTU/H	CO		0.01	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	CCR STABILIZATION REBOILER	NATURAL GAS	54	MMBTU/H	CO		0.1	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	WCR HEATER		209	MMBTU/H	CO		0.07	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, ISOM ADSORBER	NATURAL GAS	9.1	MMBTU/H	CO		0.035	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, CCR REACTOR	NATURAL GAS	500	MMBTU/H	CO		0.01	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, (5)	NATURAL GAS	50	MMBTU/H	CO		0.07	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FIRED UNITS				CO		1190	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	CRU HEATER				CO		0.03	LB/MMBTU	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU- NO.3 REACTOR FEED HEATER		58.95	MMBTU/H	CO	NONE INDICATED	4.9	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.4 REACTOR FEED HEATER		49	MMBTU/H	CO	NONE INDICATED	4	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-REFORMATE STABILIZER REBOILER		54.77	MMBTU/H	CO	NONE INDICATED	4.5	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II WEST REACTOR FEED HEATER		104.25	MMBTU/H	CO	NONE INDICATED	8.6	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II COMBINATION SPLITTER HEATER		77.62	MMBTU/H	CO	NONE INDICATED	6.4	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II XYLENE RERUN TOWER HEATER		83.7	MMBTU/H	CO	NONE INDICATED	6.9	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II EAST REACTOR FEED HEATER		75	MMBTU/H	CO	NONE INDICATED	6.2	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE I HEATER		96.23	MMBTU/H	CO	NONE INDICATED	7.9	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE II HEATER		226.42	MMBTU/H	CO	NONE INDICATED	18.6	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO. 1 REACTOR FEED HEATER		121.74	MMBTU/H	CO	NONE INDICATED	10	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.2 REACTOR FEED HEATER		69.68	MMBTU/H	CO	NONE INDICATED	5.7	LB/H	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	TWENTY ONE FURNACES	REFINERY FUEL GAS			CO		500	PPMV	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	FOURTEEN HEATERS				CO		500	PPMV	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	DHT H2 HEATER	HYDROGEN			CO		500	PPMV	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-1 DIESEL HDS HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	2.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-2 DIESEL HDS HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	2.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	7-H-2 DELAYED COKER CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	12	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-3 #4 VACUUM CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	2.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-4 #4 CRUDE CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	15.3	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-5 #4 VACUUM CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION METHODS	2.5	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-6 #4 CRUDE CHARGE HEATER				CO	GOOD COMBUSTION PRACTICES	20.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	12-H-1 FCCU RAW OIL CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	6.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	17-H-1 ALKY. ISO. STRIPPER REBOILER	FUEL GAS			CO	GOOD COMBUSTION TECHNIQUES	1.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-1 KTX. CLAR TWR. CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	0.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-2 TETRAMER SPL. REB. HTR.	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	0.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-1 KERO. HDS CHARGE HEATER, 38-H-2KEROSENE HDS HEATER, 39-H-1 #4 HC CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	3.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-2 KERO HDS FRAC REBOILER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	1.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	38-H-1 KEROSENE HDS CHARGE HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	2.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-2 #4 HC STRIPPER REBOILER				CO	GOOD COMBUSTION PRACTICES	2.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-7	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	5.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-4A/B	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	3.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 #2 REFORMER HDS CHARGER AND STRIPPER	FUEL GAS			CO	GOOD COMBUSTION TECHNIQUES	3.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q10-H-1 SMR HEATER	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	20.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q11-H-301 HCU RX CHARGE	FUEL GAS			CO		4.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 FRACTIONATOR AND Q11-H-3001,3002 HCU DEBUT. REB. AND FRACT. REB.	FUEL GAS			CO	GOOD COMBUSTION PRACTICES	2	LB/H	BACT-PSD
TX-0451	DIAMOND SHAMROCK REFINING VALERO	DIAMOND SHAMROCK REFINING COMPANY LP	TX	05/20/2004 ACT	COMBUSTION UNITS, TANKS, PROCESS VENTS, LOADING, FLARES, FUGITIVES (4), WASTEWATER, COOLING TOWERS				CO		5654.27	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for CO Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	COKER UNIT HEATERS	FUEL GAS	211	MMBTU/H	CO	GOOD BURNER TECHNOLOGY	14.68	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	VDU HEATER	FUEL GAS	99	MMBTU/H	CO	GOOD BURNER TECHNOLOGY	6.89	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	KNHT CHARGE HEATER	FUEL GAS	42	MMBTU/H	CO	GOOD BURNER TECHNOLOGY	2.92	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	DHT-3 CHARGE HEATER	FUEL GAS	50	MMBTU/H	CO	GOOD BURNER TECHNOLOGY	3.48	LB/H	BACT-PSD
TX-0580	MCKEE REFINERY HYDROGEN PRODUCTION UNIT	DIAMOND SHAMROCK REFINING COMPANY L.P.A VALERO COM	TX	12/30/2010 ACT	Hydrogen Production Unit Furnace	Refinery gas (PSA purge gas) w/NG	355.65	MMBTU/H	CO	Good combustion	50	PPMV	OTHER CASE-BY-CASE
WA-0294	FERNDALE REFINERY	CONOCO PHILLIPS 66 COMPANY	WA	06/17/2005 ACT	CAT GASOLINE DESULFURIZER FEED HEATER	REFINERY GAS	40	MMBTU/H	CO		0.0824	LB/MMBTU	BACT-PSD
WA-0301	BP CHERRY POINT REFINERY	BRITISH PETROLEUM	WA	04/20/2005 ACT	PROCESS HEATER, IHT	NATURAL GAS	13	MMBTU/H	CO	GOOD COMBUSTION PRACTICES	70	PPM	BACT-PSD
WA-0324	FERNDALE REFINERY	CONOCOPHILLIPS REFINING COMPANY	WA	06/15/2005 ACT	CGD FEED HEATER (MODEL ID SRC19)	NATURAL GAS			CO		0.0824	LB/MMBTU	BACT-PSD
WA-0343	BP CHERRY POINT REFINERY	BP WEST COAST PRODUCTS LLC	WA	11/17/2007 ACT	UTILITY AND LARGE INDUSTRIAL SIZE BOILERS/FURNACES	REFINERY GAS	363	MMBTU/H	CO	GOOD COMBUSTION PRACTICES USING MODERN BOILER AND BURNER DESIGNS TO OPTIMIZE RESIDENCE TIME, FUEL/AIR MIXING, AND COMBUSTION TEMERATURE, ALONG WITH CAREFUL BOILER OPERATION TO MINIMIZE CO EMISSIONS.	13.3	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for PM Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AL-0242	TUSCALOOSA REFINERY	HUNT REFINING COMPANY	AL	05/20/2008 ACT	EIGHT (8) PROCESS HEATERS	REFINERY GAS			PM10/PM2.5	USE OF GOOD COMBUSTION PRACTICES FROM THE RBLC FOR PROCESS HEATERS AT PETROLEUM REFINERIES.	0.0075	LB/MMBTU	BACT-PSD
AL-0246	TUSCALOOSA	HUNT REFINERY CO.	AL	09/28/2009 ACT	NINE PROCESS HEATERS IN FOUR PROCESS UNITS	REFINERY GAS			PM10/PM2.5		0.0075	LB/MMBTU PM	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	PRE-FLASH COLUMN REBOILER, SN-803	NATURAL GAS OR NSPS J QUALITY GAS	40	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICE	0.0075	LB/MMBTU	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	CONVERTED #4 PRE-FLASH COLUMN REBOILER, SN-805	NATURAL OR NSPS SUBPART J QUALITY GAS	75	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICE	0.0075	LB/MMBTU	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	NO. 4 ATMOSPHERIC FURNACE, SN-804	NATURAL OR NSPS J QUALITY GAS	280	MMBTU/H	PM10/PM2.5	GOOD COMBUSTINON PRACTICE	0.0075	LB/MMBTU	BACT-PSD
AR-0100	LION OIL COMPANY	LION OIL COMPANY	AR	10/01/2007 ACT	NEW NO. 4 VACUUM FURNACE, SN-805N	NATURAL OR NSPS SUBPART J QUALITY GAS	142.2	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICE	0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	25	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER SPLITTER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	117	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT CHARGE HEATER	REFINERY FUEL GAS AND NATURAL GAS	122	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 1	REFINERY FUEL GAS AND NATURAL GAS	192	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 2	REFINERY FUEL GAS OR NATURAL GAS	129	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT DEBUTANIZER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	23.2	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	311	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR INTERHEATER	REFINERY FULE GAS OR NATURAL GAS	328	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	VACUUM CRUDE CHARGE HEATER	REFINERY FUEL GAS OR NG	101	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT CHARGE HEATER	REFINERY FUEL GAS OR NG	70	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT MAIN FRACTIONATOR HEATER	REFINERY FUEL GAS OR NG	211	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	NAPHTHA HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NG	21.4	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT ISOSTRIPPER REBOILER	REFINERY FUEL GAS AND NATURAL GAS	222	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	ATMOSPHERIC CRUDE CHARGE HEATER	NATURAL GAS OR REFINERY FUEL GAS	346	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES	0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROGEN REFORMER HEATER	REFINERY FUEL GAS OR NATURAL GAS	1435	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for PM Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	SPRAY DRYER HEATER	REFINERY FUEL GAS OR NATURAL GAS	44	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DELAYED COKING UNIT CHARGE HEATER NOS. 1 AND 2	REFINERY FUEL GAS OR NATURAL GAS	99.5	MMBTU/H	PM10/PM2.5		0.0075	LB/MMBTU	BACT-PSD
LA-0121	CONVENT REFINERY	MOTIVA ENTERPRISES LLC	LA	05/17/2002 ACT	H-OIL TRANSPORT HEATER		21	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES	0.16	LB/H	BACT-PSD
LA-0121	CONVENT REFINERY	MOTIVA ENTERPRISES LLC	LA	05/17/2002 ACT	H-OIL ATM. TOWER HEATER		29.4	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES	0.22	LB/H	BACT-PSD
LA-0121	CONVENT REFINERY	MOTIVA ENTERPRISES LLC	LA	05/17/2002 ACT	HDS-1 HEATER	FUEL GAS	140	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES	1.04	LB/H	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	FRACTIONATOR FURNACE		360	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES, GOOD ENGINEERING DESIGN, AND CLEAN BURNING FUEL	2.88	LB/H	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	HYDROFINER FURNACE 1		150	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES, GOOD ENGINEERING DESIGN, AND CLEAN BURNING FUEL.	1.2	LB/H	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	HYDROFINER FURNACE 2		197	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES, GOOD ENGINEERING DESIGN, AND CLEAN BURNING FUELS.	1.58	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER F-72-703	REFINERY FUEL GAS	528	MMBTU/H	PM10/PM2.5	BURNING CLEAN FUEL (NATURAL GAS AND FUEL GAS), AND UTILIZING GOOD COMBUSTION PRACTICES.	2.6	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01A		46	MMBTU/H	PM10/PM2.5	GASEOUS FUEL, GOOD COMBUSTION PROCESSES	0.64	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01B		46	MMBTU/H	PM10/PM2.5	GASEOUS FUEL/ GOOD COMBUSTION PRACTICES	0.64	LB/H	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	PIPESTILL, COKER, HYDROCRACKING, & LIGHT ENDS FURNACES				PM10/PM2.5	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.008	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	PIPESTILL, COKER, CAT COMPLEX, & LIGHT ENDS FURNACES				PM10/PM2.5	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.008	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	REFORMING, HYDROFINING, & HEAVY CAT FURNACES				PM10/PM2.5	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.008	LB/MMBT	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	FEED PREPARATION FURNACES F-30 & F-31		352	MMBTU/H	PM10/PM2.5	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.008	LB/MMBTU	BACT-PSD

Table C-1 Heater RBLC Search Results for PM Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	POWERFORMING & LIGHT ENDS FURNACES				PM10/PM2.5	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.008	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	POWERFORMING 2 & EAST LIGHT ENDS FURNACES				PM10/PM2.5	GOOD ENGINEERING DESIGN AND PROPER COMBUSTION PRACTICES	0.008	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER REACTOR CHARGE HEATER (5-08), KHT REACTOR CHARGE HEATER (9-08), & HCU TRAIN 1&2 REACTOR CHARGE HEATERS (11-08 & 12-08)	REFINERY FUEL GAS			PM10/PM2.5	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0075	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER STRIPPER REBOILER HEATER (6-08) & KHT STRIPPER REBOILER HEATER (10-08)	REFINERY FUEL GAS			PM10/PM2.5	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0075	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B CRUDE HEATERS (1-08 & 2-08) & COKER CHARGE HEATER (15-08)	REFINERY FUEL GAS			PM10/PM2.5	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0075	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	PLATFORMER HEATER CELLS NO. 1-3 (7A-08, 7B-08, & 7C-08) & HCU FRACTIONATOR HEATER (13-08)	REFINERY FUEL GAS			PM10/PM2.5	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0075	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B VACUUM TOWER HEATERS (3-08 & 4-08)	REFINERY FUEL GAS	155.2	MMBTU/H EA.	PM10/PM2.5	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0075	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	THERMAL DRYING UNIT HEATEC HEATER (124-1-91)	REFINERY FUEL GAS	9.6	MM BTU/H	PM10/PM2.5		0.05	MAX LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS/REBOILERS	REFINERY FUEL GAS			PM10/PM2.5	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (2008-1 - 2008-9)	PROCESS FUEL GAS			PM10/PM2.5	COMPLY WITH 40 CFR 60 SUBPARTS NNN AND RRR	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (94-21 & 94-29)	REFINERY FUEL GAS			PM10/PM2.5	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0		BACT-PSD

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RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	CPF HEATER H-39-03 & H-39-02 (94-28 & 94-30)	REFINERY FUEL GAS			PM10/PM2.5	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0.0074	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	DHT HEATERS (4-81, 5-81)	REFINERY FUEL GAS	70	MMBTU/H EA	PM10/PM2.5	GASEOUS FUELS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATER F-72-703 (7-81)	REFINERY FUEL GAS	633	MMBTU/H	PM10/PM2.5	GASEOUS FUELS	0		BACT-PSD
LA-0245	HYDROGEN PLANT	VALERO REFINING - NEW ORLEANS, LLC	LA	12/15/2010 ACT	SMR Heaters (EQT0400 and EQT0401)	Fuel Gas	1055	MMBTU/H	PM10/PM2.5	Proper equipment designs and operations, good combustion practices	0.0075	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	CRUDE HEATER	REFINERY FUEL GAS	165	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACITICES, USE OF CLEAN BURNING FUELS	0.0075	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	VACUUM HEATER	REFINERY FUEL GAS	58	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES/USE OF CLEAN BURNING FUELS	0.0075	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	NO. 1 H2 HEATER	REFINERY FUEL GAS/ PSA GAS	266	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES/USE OF CLEAN BURNING FUELS	0.0075	LB/MMBTU	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	NO. 2 H2 HEATER	REFINERY FUEL GAS / PSA GAS	215	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICES/USE OF CLEAN BURNING FUELS	0.0075	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER FRACTIONATOR FURNACE	REFINERY FUEL GAS	9.6	MMBTU/H	PM10/PM2.5	GASEOUS FUEL COMBUSTION ONLY	0.0075	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER REBOILER	REFINERY FUEL GAS	35	MMBTU/H	PM10/PM2.5	GASEOUS FUEL COMBUSTION ONLY	0.0075	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STEAM METHANE REFORMER HEATER	NATURAL GAS AND REFORMER OFF-GAS	337	MMBTU/H	PM10/PM2.5	GASEOUS FUEL COMBUSTION ONLY	0.0075	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	ROSE 2 HOT OIL HEATER	REFINERY FUEL GAS	120	MMBTU/H	PM10/PM2.5	GASEOUS FUEL COMBUSTION ONLY	0.0075	LB/MMBTU	BACT-PSD
OH-0329	BP-HUSKY REFINING LLC	BP PRODUCTS, NORTH AMERICA INC.	OH	08/07/2009 ACT	REFORMER HEATER	REFINERY FUEL GAS	519	MMBTU/H	PM10/PM2.5	NO ADD ON CONTROLS WERE REASONABLY COST-EFFECTIVE	3.9	LB/H	BACT-PSD
OK-0098	PONCA CITY REF	CONOCOPHILLIPS PONCA CITY REFINERY	OK	03/31/2004 ACT	CRUDE VACUUM UNIT, HEATER H-0016	REFINERY FUEL GAS			PM10/PM2.5	GOOD COMBUSTION PRACTICES	0.8	LB/H	BACT-PSD
OK-0098	PONCA CITY REF	CONOCOPHILLIPS PONCA CITY REFINERY	OK	03/31/2004 ACT	CRUDE CHARGE UNIT, HEATER H-0001	REFINERY FUEL GAS			PM10/PM2.5	GOOD COMBUSTION PRACTICES	1.31	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	DELAYED COKER UNIT, HEATER	REFINERY GAS	116	MMBTU/H	PM10/PM2.5	SPRAY CHAMBER, GOOD COMBUSTION PRACTICE	0.1	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	FCC FEED HYDROTREATER HEATER	REFINERY GAS	91	MMBTU/H	PM10/PM2.5	GOOD COMBUSTION PRACTICE	0.09	LB/H	Other Case-by-Case
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, ECU, NO. 2 NORTH & SOUTH	NATURAL GAS	166.5	MMBTU/H	PM10/PM2.5		0.005	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	NHDS NO. 1 CHARGE HEATER	NATURAL GAS	42.2	MMBTU/H	PM10/PM2.5		0.014	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, ALKY UNIT ISO-STRIPPER REBOILER	NATURAL GAS	166.5	MMBTU/H	PM10/PM2.5		0.005	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	CCR STABILIZATION REBOILER	NATURAL GAS	54	MMBTU/H	PM10/PM2.5		0.005	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	WCR HEATER		209	MMBTU/H	PM10/PM2.5		0.005	LB/MMBTU	BACT-PSD

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TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, ISOM ADSORBER	NATURAL GAS	9.1	MMBTU/H	PM10/PM2.5		0.014	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATER, CCR REACTOR	NATURAL GAS	500	MMBTU/H	PM10/PM2.5		0.005	LB/MMBTU	BACT-PSD
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, (5)	NATURAL GAS	50	MMBTU/H	PM10/PM2.5		0.005	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FIRED UNITS				PM10/PM2.5		223.3	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU- NO.3 REACTOR FEED HEATER		58.95	MMBTU/H	PM10/PM2.5		0.75	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.4 REACTOR FEED HEATER		49	MMBTU/H	PM10/PM2.5		0.63	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-REFORMATE STABILIZER REBOILER		54.77	MMBTU/H	PM10/PM2.5		0.7	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II WEST REACTOR FEED HEATER		104.25	MMBTU/H	PM10/PM2.5		1.33	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II COMBINATION SPLITTER HEATER		77.62	MMBTU/H	PM10/PM2.5		0.99	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II XYLENE RERUN TOWER HEATER		83.7	MMBTU/H	PM10/PM2.5		1.06	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II EAST REACTOR FEED HEATER		75	MMBTU/H	PM10/PM2.5		0.96	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE I HEATER		96.23	MMBTU/H	PM10/PM2.5		1.23	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE II HEATER		226.42	MMBTU/H	PM10/PM2.5		2.89	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO. 1 REACTOR FEED HEATER		121.74	MMBTU/H	PM10/PM2.5		1.56	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.2 REACTOR FEED HEATER		69.68	MMBTU/H	PM10/PM2.5		0.89	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-1 DIESEL HDS HEATER	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND GOOD COMBUSTION PRACTICES	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-2 DIESEL HDS HEATER	FUEL GAS			PM10/PM2.5	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	7-H-2 DELAYED COKER CHARGE HEATER	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	1.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-3 #4 VACUUM CHARGE HEATER	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-4 #4 CRUDE CHARGE HEATER	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	1.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-5 #4 VACUUM CHARGE HEATER	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-6 #4 CRUDE CHARGE HEATER				PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	1.9	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for PM Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	12-H-1 FCCU RAW OIL CHARGE HEATER	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.6	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	17-H-1 ALKY. ISO. STRIPPER REBOILER	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-1 KTX. CLAR TWR. CHARGE HEATER	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-2 TETRAMER SPL. REB. HTR.	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-1 KERO. HDS CHARGE HEATER, 38-H-2KEROSENE HDS HEATER, 39-H-1 #4 HC CHARGE HEATER	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-2 KERO HDS FRAC REBOILER	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	38-H-1 KEROSENE HDS CHARGE HEATER	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-2 #4 HC STRIPPER REBOILER				PM10/PM2.5	FUEL GAS AND GOOD COMBUSTION PRACTICES	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-7	FUEL GAS			PM10/PM2.5	FUEL GAS AND GOOD COMBUSTION PRACTICES	0.5	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-4A/B	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION TECHNOLOGY	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 #2 REFORMER HDS CHARGER AND STRIPPER	FUEL GAS			PM10/PM2.5	FUEL GAS AND EFFICIENT COMBUSTION	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q10-H-1 SMR HEATER	FUEL GAS			PM10/PM2.5	GOOD COMBUSTION PRACTICES	1.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q11-H-301 HCU RX CHARGE	FUEL GAS			PM10/PM2.5		0.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 FRACTIONATOR AND Q11-H-3001,3002 HCU DEBUT. REB. AND FRACT. REB.	FUEL GAS			PM10/PM2.5	USE FUEL GAS AND EFFICIENT COMBUSTION TECHNIQUES	0.2	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for PM Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0451	DIAMOND SHAMROCK REFINING VALERO	DIAMOND SHAMROCK REFINING COMPANY LP	TX	05/20/2004 ACT	COMBUSTION UNITS, TANKS, PROCESS VENTS, LOADING, FLARES, FUGITIVES (4), WASTEWATER, COOLING TOWERS				PM10/PM2.5		69.21	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	COKER UNIT HEATERS	FUEL GAS	211	MMBTU/H	PM10/PM2.5	GOOD BURNER TECHNOLOGY	1.57	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	VDU HEATER	FUEL GAS	99	MMBTU/H	PM10/PM2.5	GOOD BURNER TECHNOLOGY	0.74	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	KNHT CHARGE HEATER	FUEL GAS	42	MMBTU/H	PM10/PM2.5	GOOD BURNER TECHNOLOGY	0.31	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	DHT-3 CHARGE HEATER	FUEL GAS	50	MMBTU/H	PM10/PM2.5	GOOD BURNER TECHNOLOGY	0.37	LB/H	BACT-PSD
WA-0343	BP CHERRY POINT REFINERY	BP WEST COAST PRODUCTS LLC	WA	11/17/2007 ACT	UTILITY AND LARGE INDUSTRIAL SIZE BOILERS/FURNACES	REFINERY GAS	363	MMBTU/H	PM10/PM2.5	BURN ONLY REFINERY FUEL GAS/NATURAL GAS	3.4	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	25	MMBTU/H	SO2	S LIMITED TO 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DISTILLATE HYDROTREATER SPLITTER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	117	MMBTU/H	SO2	S LIMITED TO 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT CHARGE HEATER	REFINERY FUEL GAS AND NATURAL GAS	122	MMBTU/H	SO2	SULFUR LIMITED TO 35 PPM IN FUEL.	35	PPMV	
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 1	REFINERY FUEL GAS AND NATURAL GAS	192	MMBTU/H	SO2	S LIMITED TO 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT INTERHEATER NO. 2	REFINERY FUEL GAS OR NATURAL GAS	129	MMBTU/H	SO2	S LIMITED TO 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	CATALYTIC REFORMING UNIT DEBUTANIZER REBOILER	REFINERY FUEL GAS OR NATURAL GAS	23.2	MMBTU/H	SO2	S LIMIT OF 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR CHARGE HEATER	REFINERY FUEL GAS OR NATURAL GAS	311	MMBTU/H	SO2	35 PPM SULFUR LIMIT ON FUEL BURNED.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT DEHYDROGENATION REACTOR INTERHEATER	REFINERY FULE GAS OR NATURAL GAS	328	MMBTU/H	SO2	SULFUR LIMIT OF 35 PPM IN FUEL BURNED.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	VACUUM CRUDE CHARGE HEATER	REFINERY FUEL GAS OR NG	101	MMBTU/H	SO2		35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT CHARGE HEATER	REFINERY FUEL GAS OR NG	70	MMBTU/H	SO2	S LIMITED TO 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROCRACKER UNIT MAIN FRACTIONATOR HEATER	REFINERY FUEL GAS OR NG	211	MMBTU/H	SO2	S LIMITED TO 35 PPM.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	NAPHTHA HYDROTREATER CHARGE HEATER	REFINERY FUEL GAS OR NG	21.4	MMBTU/H	SO2	S LIMITED TO 35 PPM	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	BUTANE CONVERSION UNIT ISOSTRIPPER REBOILER	REFINERY FUEL GAS AND NATURAL GAS	222	MMBTU/H	SO2	SULFUR LIMITED TO 35 PPM IN FUEL BURNED.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	ATMOSPHERIC CRUDE CHARGE HEATER	NATURAL GAS OR REFINERY FUEL GAS	346	MMBTU/H	SO2	35 PPM SULFUR LIMIT IN FUEL.	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	HYDROGEN REFORMER HEATER	REFINERY FUEL GAS OR NATURAL GAS	1435	MMBTU/H	SO2	S LIMITED TO 35 PPM	35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	SPRAY DRYER HEATER	REFINERY FUEL GAS OR NATURAL GAS	44	MMBTU/H	SO2		35	PPMV	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	DELAYED COKING UNIT CHARGE HEATER NOS. 1 AND 2	REFINERY FUEL GAS OR NATURAL GAS	99.5	MMBTU/H	SO2	FUEL LIMITED TO 35 PPM S.	35	PPMV	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	FRACTIONATOR FURNACE		360	MMBTU/H	SO2	USE OF CLEAN FUELS WITH A MAXIMUM SULFUR CONTENT LESS THAN 0.10 GR/DSCF (160 PPMV) H2S IN FUEL.	12.47	LB/H	BACT-PSD
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	HYDROFINER FURNACE 1		150	MMBTU/H	SO2	USE OF CLEAN FUELS WITH A MAXIMUM SULFUR CONTENT OF LESS THAN 0.10 GR/DSCF (160 PPMV) H2S IN FUEL.	5.1	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0123	BATON ROUGE REFINERY	EXXONMOBIL REFINING AND SUPPLY COMPANY	LA	04/26/2002 ACT	HYDROFINER FURNACE 2		197	MMBTU/H	SO2	USE OF CLEAN FUELS WITH A MAXIMUM SULFUR CONTENT OF LESS THAN 0.10 GR/DSCF (160 PPMV) H2S IN FUEL.	6.93	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER F-72-703	REFINERY FUEL GAS	528	MMBTU/H	SO2	LOW SULFUR REFINERY FUEL GAS	14.2	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01A		46	MMBTU/H	SO2	COMBUSTION OF LOW SULFUR FUEL	1.2	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01B		46	MMBTU/H	SO2	COMBUSTION OF LOW SULFUR FUELS	1.2	LB/H	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	PIPESTILL, COKER, HYDROCRACKING, & LIGHT ENDS FURNACES				SO2	LIMIT CONCENTRATION OF H2S IN FUEL GAS TO NSPS SUBPART J LIMIT OF 160 PPMV (0.01 GR/DSCF)	0.034	LB/MMBTU	RACT
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	PIPESTILL, COKER, CAT COMPLEX, & LIGHT ENDS FURNACES				SO2	LIMIT CONCENTRATION OF H2S IN FUEL GAS TO NSPS SUBPART J LIMIT OF 160 PPMV (0.01 GR/DSCF)	0.034	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	REFORMING, HYDROFINING, & HEAVY CAT FURNACES				SO2	LIMIT CONCENTRATION OF H2S IN FUEL GAS TO NSPS SUBPART J LIMIT OF 160 PPMV (0.01 GR/DSCF)	0.034	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	FEED PREPARATION FURNACES F-30 & F-31		352	MMBTU/H	SO2	LIMIT CONCENTRATION OF H2S IN FUEL GAS TO NSPS SUBPART J LIMIT OF 160 PPMV (0.01 GR/DSCF)	0.1778	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	POWERFORMING & LIGHT ENDS FURNACES				SO2	LIMIT CONCENTRATION OF H2S IN FUEL GAS TO NSPS SUBPART J LIMIT OF 160 PPMV (0.01 GR/DSCF)	0.1778	LB/MMBTU	BACT-PSD
LA-0206	BATON ROUGE REFINERY	EXXONMOBIL REFINING & SUPPLY CO	LA	02/18/2004 ACT	POWERFORMING 2 & EAST LIGHT ENDS FURNACES				SO2	LIMIT CONCENTRATION OF H2S IN FUEL GAS TO NSPS SUBPART J LIMIT OF 160 PPMV (0.01 GR/DSCF)	0.1778	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER REACTOR CHARGE HEATER (5-08), KHT REACTOR CHARGE HEATER (9-08), & HCU TRAIN 1&2 REACTOR CHARGE HEATERS (11-08 & 12-08)	REFINERY FUEL GAS			SO2	USE OF LOW SULFUR REFINERY FUEL GAS	25	PPMV AS H2S	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER STRIPPER REBOILER HEATER (6-08) & KHT STRIPPER REBOILER HEATER (10-08)	REFINERY FUEL GAS			SO2	USE OF LOW SULFUR REFINERY FUEL GAS	25	PPMV AS H2S	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B CRUDE HEATERS (1-08 & 2-08) & COKER CHARGE HEATER (15-08)	REFINERY FUEL GAS			SO2	USE OF LOW SULFUR REFINERY FUEL GAS	25	PPMV	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	PLATFORMER HEATER CELLS NO. 1-3 (7A-08, 7B-08, & 7C-08) & HCU FRACTIONATOR HEATER (13-08)	REFINERY FUEL GAS			SO2	USE OF LOW SULFUR REFINERY FUEL GAS	25	PPMV AS H2S	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B VACUUM TOWER HEATERS (3-08 & 4-08)	REFINERY FUEL GAS	155.2	MMBTU/H EA.	SO2	USE OF LOW SULFUR REFINERY FUEL GAS	25	PPMV	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	THERMAL DRYING UNIT HEATEC HEATER (124-1-91)	REFINERY FUEL GAS	9.6	MM BTU/H	SO2		0.2	MAX LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS/REBOILERS	REFINERY FUEL GAS			SO2	USE OF PIPELINE QUALITY NATURAL GAS OR REFINERY FUEL GASES WITH AN H2S CONCENTRATION LESS THAN 100 PPMV (ANNUAL AVERAGE).	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (2008-1 - 2008-9)	PROCESS FUEL GAS			SO2	USE OF PIPELINE QUALITY NATURAL GAS OR PROCESS FUEL GASES WITH AN H2S CONCENTRATION LESS THAN 10 PPMV (ANNUAL AVERAGE).	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (94-21 & 94-29)	REFINERY FUEL GAS			SO2	USE OF PIPELINE QUALITY NATURAL GAS OR REFINERY FUEL GASES WITH AN H2S CONCENTRATION LESS THAN 100 PPMV (ANNUAL AVERAGE).	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	CPF HEATER H-39-03 & H-39-02 (94-28 & 94-30)	REFINERY FUEL GAS			SO2	USE OF PIPELINE QUALITY NATURAL GAS OR REFINERY FUEL GASES WITH AN H2S CONCENTRATION LESS THAN 100 PPMV (ANNUAL AVERAGE).	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	DHT HEATERS (4-81, 5-81)	REFINERY FUEL GAS	70	MMBTU/H EA	SO2	FUELED BY NATURAL GAS OR REFINERY FUEL GAS WITH H2S <= 100 PPMV (ANNUAL AVERAGE)	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATER F-72-703 (7-81)	REFINERY FUEL GAS	633	MMBTU/H	SO2	FUELED BY NATURAL GAS OR REFINERY FUEL GAS WITH H2S <= 100 PPMV (ANNUAL AVERAGE)	0		BACT-PSD
LA-0234	LAKE CHARLES COMPLEX - CAT GAS HYDRO	CITGO PETROLEUM COMPANY	LA	01/26/2009 ACT	3(XXXIV)7-102 FURNACE B-102	FUEL GAS	62.8	MMBTU/H	SO2	LOW SULFUR CONCENTRATION IN THE FUEL GAS	5.08	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0234	LAKE CHARLES COMPLEX - CAT GAS HYDRO	CITGO PETROLEUM COMPANY	LA	01/26/2009 ACT	3(XXXIV)7-201 FURNACE B-201	FUEL GAS	56.9	MMBTU/H	SO2	LOW SULFUR CONCENTRATION IN THE FUEL GAS	5.08	LB/H	BACT-PSD
LA-0234	LAKE CHARLES COMPLEX - CAT GAS HYDRO	CITGO PETROLEUM COMPANY	LA	01/26/2009 ACT	3(XXXIV)7-202 FURNACE B-202	FUEL GAS	56.9	MMBTU/H	SO2	LOW SULFUR CONCENTRATION IN THE FUEL GAS	5.08	LB/H	BACT-PSD
LA-0234	LAKE CHARLES COMPLEX - CAT GAS HYDRO	CITGO PETROLEUM COMPANY	LA	01/26/2009 ACT	3(XXXIV)7-103 REBOILER B-103	FUEL GAS	38.3	MMBTU/H	SO2	LOW SULFUR CONCENTRATION IN THE FUEL GAS	3.1	LB/H	BACT-PSD
LA-0234	LAKE CHARLES COMPLEX - CAT GAS HYDRO	CITGO PETROLEUM COMPANY	LA	01/26/2009 ACT	3(XXXIV)7-203 REBOILER B-203	FUEL GAS	38.3	MMBTU/H	SO2	LOW SULFUR CONCENTRATION IN THE FUEL GAS	3.1	LB/H	BACT-PSD
LA-0234	LAKE CHARLES COMPLEX - CAT GAS HYDRO	CITGO PETROLEUM COMPANY	LA	01/26/2009 ACT	3(XXXIV)7-101 FURNACE B-101	FUEL GAS	62.8	MMBTU/H	SO2	USE LOW SULFUR CONCENTRATION FUEL GAS.	5.08	LB/H	BACT-PSD
LA-0238	ALLIANCE REFINERY	CONOCOPHILLIPS COMPANY	LA	07/10/2009 ACT	FCCU FEED HEATER	REFINERY GAS	181.7	MMBTU/H	SO2	COMPLY WITH 40 CFR 60 SUBPART J	4.79	LB/H	BACT-PSD
LA-0245	HYDROGEN PLANT	VALERO REFINING - NEW ORLEANS, LLC	LA	12/15/2010 ACT	SMR Heaters (EQT0400 and EQT0401)	Fuel Gas	1055	MMBTU/H	SO2	Limit maximum H2S concentration in fuels to 60 ppmv (annual average)	16.7	LB/H	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	CRUDE HEATER	REFINERY FUEL GAS	165	MMBTU/H	SO2	FUEL GAS CLEANUP - CHEMICAL ABSORPTION/AMINE SYSTEM	34	PPMV H2S	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	VACUUM HEATER	REFINERY FUEL GAS	58	MMBTU/H	SO2	FUEL GAS CLEANUP - CHEMICAL ABSORPTION/AMINE SYSTEM	34	PPMV H2S	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	NO. 1 H2 HEATER	REFINERY FUEL GAS/ PSA GAS	266	MMBTU/H	SO2	FUEL GAS CLEANUP - CHEMICAL ABSORPTION/AMINE SYSTEM	34	PPMV H2S	BACT-PSD
MT-0030	BILLINGS REFINERY	CONOCOPHILLIPS COMPANY	MT	11/19/2008 ACT	NO. 2 H2 HEATER	REFINERY FUEL GAS / PSA GAS	215	MMBTU/H	SO2	FUEL GAS CLEANUP - CHEMICAL ABSORPTION/AMINE SYSTEM	34	PPMV H2S	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER FRACTIONATOR FURNACE	REFINERY FUEL GAS	9.6	MMBTU/H	SO2	REFINERY FUEL GAS SULFUR CLEANING	60	PPMV	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER REBOILER	REFINERY FUEL GAS	35	MMBTU/H	SO2	REFINERY FUEL GAS SULFUR REMOVAL	60	PPMV	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	SULFUR RECOVERY HOT OIL HEATER	REFINERY FUEL GAS	9.6	MMBTU	SO2	REFINERY FUEL GAS SULFUR REMOVAL	60	PPMV	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STEAM METHANE REFORMER HEATER	NATURAL GAS AND REFORMER OFF-GAS	337	MMBTU/H	SO2	PIPELINE QUALITY NATURAL GAS	0.494	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	ROSE 2 HOT OIL HEATER	REFINERY FUEL GAS	120	MMBTU/H	SO2	REFINERY FUEL GAS SULFUR REMOVAL	60	PPMV	BACT-PSD
OH-0329	BP-HUSKY REFINING LLC	BP PRODUCTS, NORTH AMERICA INC.	OH	08/07/2009 ACT	REFORMER HEATER	REFINERY FUEL GAS	519	MMBTU/H	SO2		15.52	LB/H	N/A
OK-0095	ARDMORE REFINERY	TPI PETROLEUM, INC	OK	09/03/2003 ACT	HOT OIL HEATERS				SO2	LOW SULFUR FUEL	160	S02 PPMDV	BACT-PSD
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	DELAYED COKER UNIT, HEATER	REFINERY GAS	116	MMBTU/H	SO2	LOW SULFUR REFINERY GAS	2.71	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	FCC FEED HYDROTREATER HEATER	REFINERY GAS	91	MMBTU/H	SO2	LOW SULFUR REFINERY GAS	2.44	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	NORTH CRUDE HEATER	REFINERY GAS	147	MMBTU/H	SO2	USE OF DESULFURIZED REFINERY GAS	46.22	LB/H	Other Case-by-Case

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	WILLIAMS REFINING & MARKETING, L.L.C.	TN	04/03/2002 ACT	HEATERS, (5)	NATURAL GAS	50	MMBTU/H	SO2	FUEL SULFUR LIMITS	0		BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FIRED UNITS				SO2		474	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU- NO.3 REACTOR FEED HEATER		58.95	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	1.5	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.4 REACTOR FEED HEATER		49	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	1.3	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-REFORMATE STABILIZER REBOILER		54.77	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	1.4	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II WEST REACTOR FEED HEATER		104.25	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	2.7	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II COMBINATION SPLITTER HEATER		77.62	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	2	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II XYLENE RERUN TOWER HEATER		83.7	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	2.2	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II EAST REACTOR FEED HEATER		75	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	1.9	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE I HEATER		96.23	MMBTU/H	SO2	LOW SULFUR CONTENT FUEL: USE REFINERY FUEL GAS WITH NO MORE THAN 0.1 GR/DSCF H2S OR USE NATURAL GAS WITH NO MORE THAN 0.25 GR/100 DSCF H2S AND NO MORE THAN 5.0 GR/100 DSCF TOTAL S.	2.5	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE II HEATER		226.42	MMBTU/H	SO2	LOW SULFUR CONTENT FUEL: USE REFINERY FUEL GAS WITH NO MORE THAN 0.1 GR/DSCF H2S OR USE NATURAL GAS WITH NO MORE THAN 0.25 GR/100 DSCF H2S AND NO MORE THAN 5.0 GR/100 DSCF TOTAL S.	5.8	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO. 1 REACTOR FEED HEATER		121.74	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	3.1	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.2 REACTOR FEED HEATER		69.68	MMBTU/H	SO2	LOW S FUEL: FUEL GAS WITH H2S CONTENT NO MORE THAN 0.1 GR/DSCF OVER A 3 H ROLLING BASIS, OR NATURAL GAS WITH H2S CONTENT NO MORE THAN 0.25 GR/100 DSCF AND TOTAL S CONTENT NO MORE THAN 5.0 GR/ 100 DSCF.	1.8	LB/H	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	TWENTY ONE FURNACES	REFINERY FUEL GAS			SO2		300	PPM	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	FOURTEEN HEATERS				SO2		300	PPM	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	DHT H2 HEATER	HYDROGEN			SO2		300	PPMV	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-1 DIESEL HDS HEATER	FUEL GAS			SO2	LIMIT THE CONENT OF H2S IN FUEL GAS	0.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-2 DIESEL HDS HEATER	FUEL GAS			SO2	LOWER THE CONTENT OF H2S IN FUEL GAS	0.6	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	7-H-2 DELAYED COKER CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	3.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-3 #4 VACUUM CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	0.6	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-4 #4 CRUDE CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-5 #4 VACUUM CHARGE HEATER	FUEL GAS			SO2	LIMIT HS2 CONTENT IN FUEL GAS	0.6	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-6 #4 CRUDE CHARGE HEATER				SO2	LIMIT H2S CONTENT IN FUEL GAS	5.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	12-H-1 FCCU RAW OIL CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	17-H-1 ALKY. ISO. STRIPPER REBOILER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	0.5	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-1 KTX. CLAR TWR. CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S IN FUEL GAS	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-2 TETRAMER SPL. REB. HTR.	FUEL GAS			SO2	LIMIT H2S IN FUEL GAS	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-1 KERO. HDS CHARGE HEATER, 38-H-2KEROSENE HDS HEATER, 39-H-1 #4 HC CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S IN FUEL GAS	0.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-2 KERO HDS FRAC REBOILER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	38-H-1 KEROSENE HDS CHARGE HEATER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	0.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-2 #4 HC STRIPPER REBOILER				SO2	LIMIT H2S CONTENT IN FUEL GAS	0.7	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-7	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	1.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-4A/B	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	1.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 #2 REFORMER HDS CHARGER AND STRIPPER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	0.9	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q10-H-1 SMR HEATER	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	7.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q11-H-301 HCU RX CHARGE	FUEL GAS			SO2		1.5	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 FRACTIONATOR AND Q11-H-3001,3002 HCU DEBUT. REB. AND FRACT. REB.	FUEL GAS			SO2	LIMIT H2S CONTENT IN FUEL GAS	0.7	LB/H	BACT-PSD
TX-0451	DIAMOND SHAMROCK REFINING VALERO	DIAMOND SHAMROCK REFINING COMPANY LP	TX	05/20/2004 ACT	COMBUSTION UNITS, TANKS, PROCESS VENTS, LOADING, FLARES, FUGITIVES (4), WASTEWATER, COOLING TOWERS				SO2		466.38	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	COKER UNIT HEATERS	FUEL GAS	211	MMBTU/H	SO2	GOOD BURNER TECHNOLOGY	5.06	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	VDU HEATER	FUEL GAS	99	MMBTU/H	SO2	GOOD BURNER TECHNOLOGY	2.37	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	KNHT CHARGE HEATER	FUEL GAS	42	MMBTU/H	SO2	GOOD BURNER TECHNOLOGY	1.01	LB/H	BACT-PSD
TX-0539	TOTAL PORT ARTHUR - SRU AND CRUDE HANDLING	TOTAL REFINING - PORT ARTHUR	TX	07/22/2009 ACT	DHT-3 CHARGE HEATER	FUEL GAS	50	MMBTU/H	SO2	GOOD BURNER TECHNOLOGY	1.2	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for SO2 Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0580	MCKEE REFINERY HYDROGEN PRODUCTION UNIT	DIAMOND SHAMROCK REFINING COMPANY L.P.A VALERO COM	TX	12/30/2010 ACT	Hydrogen Production Unit Furnace	Refinery gas (PSA purge gas) w/NG	355.65	MMBTU/H	SO2	Sulfur content of the fuel used in the furnace is limited to 5 grains/100dscf on an annual average basis	0		OTHER CASE-BY-CASE
WA-0343	BP CHERRY POINT REFINERY	BP WEST COAST PRODUCTS LLC	WA	11/17/2007 ACT	UTILITY AND LARGE INDUSTRIAL SIZE BOILERS/FURNACES	REFINERY GAS	363	MMBTU/H	SO2	BURN ONLY REFINERY FUEL GAS/NATURAL GAS.	13.6	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AL-0242	TUSCALOOSA REFINERY	HUNT REFINING COMPANY	AL	05/20/2008 ACT	EIGHT (8) PROCESS HEATERS	REFINERY GAS			VOC	USE OF GOOD COMBUSTION PRACTICES AS OUTLINED IN THE RBLC FOR PROCESS HEATERS LOCATED AT PETROLEUM REFINERIES.	0.0054	LB/MMBTU	BACT-PSD
IL-0103	CONOCOPHILLIPS WOOD RIVER REFINERY	CONOCOPHILLIPS	IL	08/05/2008 ACT	NEW AND MODIFIED HEATERS (7 NEW, 1 MODIFIED)	REFINERY FUEL GAS		MMBTU/H	VOC	GOOD COMBUSTION PRACTICES.	0.003	LB/MMBTU	LAER
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER F-72-703	REFINERY FUEL GAS	528	MMBTU/H	VOC	NONE INDICATED	0.74	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01A		46	MMBTU/H	VOC	NONE INDICATED	0.13	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	HEATER H-15-01B		46	MMBTU/H	VOC	NONE INDICATED	0.13	LB/H	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER REACTOR CHARGE HEATER (5-08), KHT REACTOR CHARGE HEATER (9-08), & HCU TRAIN 1&2 REACTOR CHARGE HEATERS (11-08 & 12-08)	REFINERY FUEL GAS			VOC	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0015	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	NAPHTHA HYDROTREATER STRIPPER REBOILER HEATER (6-08) & KHT STRIPPER REBOILER HEATER (10-08)	REFINERY FUEL GAS			VOC	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0015	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B CRUDE HEATERS (1-08 & 2-08) & COKER CHARGE HEATER (15-08)	REFINERY FUEL GAS			VOC	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0015	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	PLATFORMER HEATER CELLS NO. 1-3 (7A-08, 7B-08, & 7C-08) & HCU FRACTIONATOR HEATER (13-08)	REFINERY FUEL GAS			VOC	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0015	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	A & B VACUUM TOWER HEATERS (3-08 & 4-08)	REFINERY FUEL GAS	155.2	MMBTU/H EA.	VOC	PROPER DESIGN, OPERATION, AND GOOD ENGINEERING PRACTICES	0.0015	LB/MMBTU	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	THERMAL DRYING UNIT HEATEC HEATER (124-1-91)	REFINERY FUEL GAS	9.6	MM BTU/H	VOC		0.15	MAX LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS/REBOILERS	REFINERY FUEL GAS			VOC	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (2008-1 - 2008-9)	PROCESS FUEL GAS			VOC	COMPLY WITH 40 CFR 60 SUBPARTS NNN AND RRR	0		BACT-PSD

Table C-1 Heater RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATERS (94-21 & 94-29)	REFINERY FUEL GAS			VOC	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	CPF HEATER H-39-03 & H-39-02 (94-28 & 94-30)	REFINERY FUEL GAS			VOC	PROPER EQUIPMENT DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES, AND USE OF GASEOUS FUELS	0.0054	LB/MMBTU	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	DHT HEATERS (4-81, 5-81)	REFINERY FUEL GAS	70	MMBTU/H EA	VOC	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	HEATER F-72-703 (7-81)	REFINERY FUEL GAS	633	MMBTU/H	VOC	PROPER DESIGN AND OPERATION, GOOD COMBUSTION PRACTICES	0		BACT-PSD
LA-0245	HYDROGEN PLANT	VALERO REFINING - NEW ORLEANS, LLC	LA	12/15/2010 ACT	SMR Heaters (EQT0400 and EQT0401)	Fuel Gas	1055	MMBTU/H	VOC	Proper equipment designs and operations, good combustion practices	0.0054	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER FRACTIONATOR FURNACE	REFINERY FUEL GAS	9.6	MMBTU/H	VOC	GASEOUS FUEL COMBUSTION ONLY	0.005	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	HYDROCRACKER REBOILER	REFINERY FUEL GAS	35	MMBTU/H	VOC	GASEOUS FUEL COMBUSTION ONLY	0.005	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STEAM METHANE REFORMER HEATER	NATURAL GAS AND REFORMER OFF-GAS	337	MMBTU/H	VOC	GASEOUS FUEL COMBUSTION ONLY	0.005	LB/MMBTU	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	ROSE 2 HOT OIL HEATER	REFINERY FUEL GAS	120	MMBTU/H	VOC	GASEOUS FUEL COMBUSTION ONLY.	0.005	LB/MMBTU	BACT-PSD
OH-0329	BP-HUSKY REFINING LLC	BP PRODUCTS, NORTH AMERICA INC.	OH	08/07/2009 ACT	REFORMER HEATER	REFINERY FUEL GAS	519	MMBTU/H	VOC		2.8	LB/H	N/A
OK-0102	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	08/18/2004 ACT	PROCESS HEATERS AND BOILERS	REFINERY FUEL GAS			VOC	GOOD COMBUSTION PRACTICE	0.0054	LB/MMBTU	BACT-PSD
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	DELAYED COKER UNIT, HEATER	REFINERY GAS	116	MMBTU/H	VOC	GOOD COMBUSTION PRACTICE	0.545	LB/H	Other Case-by-Case
PA-0231	UNITED REFINERY CO.	UNITED REFINERY CO	PA	10/09/2003 ACT	FCC FEED HYDROTREATER HEATER	REFINERY GAS	91	MMBTU/H	VOC	GOOD COMBUSTION PRACTICE	0.49	LB/H	Other Case-by-Case
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FIRED UNITS				VOC		4013	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU- NO.3 REACTOR FEED HEATER		58.95	MMBTU/H	VOC	NONE INDICATED	0.32	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.4 REACTOR FEED HEATER		49	MMBTU/H	VOC	NONE INDICATED	0.26	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-REFORMATE STABILIZER REBOILER		54.77	MMBTU/H	VOC	NONE INDICATED	0.3	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II WEST REACTOR FEED HEATER		104.25	MMBTU/H	VOC	NONE INDICATED	0.56	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II COMBINATION SPLITTER HEATER		77.62	MMBTU/H	VOC	NONE INDICATED	0.42	LB/H	BACT-PSD
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II XYLENE RERUN TOWER HEATER		83.7	MMBTU/H	VOC	NONE INDICATED	0.45	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ISOM II EAST REACTOR FEED HEATER		75	MMBTU/H	VOC	NONE INDICATED	0.4	LB/H	N/A

Table C-1 Heater RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE I HEATER		96.23	MMBTU/H	VOC	NONE INDICATED	0.52	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	ORTHOXYLENE II HEATER		226.42	MMBTU/H	VOC	NONE INDICATED	1.22	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO. 1 REACTOR FEED HEATER		121.74	MMBTU/H	VOC	NONE INDICATED	0.66	LB/H	N/A
TX-0375	LYONDELL - CITGO REFINING, LP	LYONDELL - CITGO REFINING, LP	TX	03/14/2002 EST	BTU-NO.2 REACTOR FEED HEATER		69.68	MMBTU/H	VOC	NONE INDICATED	0.38	LB/H	N/A
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-1 DIESEL HDS HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	44-H-2 DIESEL HDS HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	7-H-2 DELAYED COKER CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.8	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-3 #4 VACUUM CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-4 #4 CRUDE CHARGE HEATER	FUEL GAS			VOC	G OOD COMBUSTION PRACTICES	1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-5 #4 VACUUM CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	8-H-6 #4 CRUDE CHARGE HEATER				VOC	GOOD COMBUSTION PRACTICES	1.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	12-H-1 FCCU RAW OIL CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	17-H-1 ALKY. ISO. STRIPPER REBOILER	FUEL GAS			VOC	GOOD COMBUSTION TECHNIQUES	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-1 KTX. CLAR TWR. CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	27-H-2 TETRAMER SPL. REB. HTR.	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-1 KERO. HDS CHARGE HEATER, 38-H-2KEROSENE HDS HEATER, 39-H-1 #4 HC CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	37-H-2 KERO HDS FRAC REBOILER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.1	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	38-H-1 KEROSENE HDS CHARGE HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-2 #4 HC STRIPPER REBOILER				VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD

Table C-1 Heater RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	39-H-7	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-4A/B	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 #2 REFORMER HDS CHARGER AND STRIPPER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.2	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q10-H-1 SMR HEATER	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	1.4	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q11-H-301 HCU RX CHARGE	FUEL GAS			VOC		0.3	LB/H	BACT-PSD
TX-0443	VALERO CORPUS CHRISTI REFINERY EAST PLANT	VALERO REFINING - TEXAS LP	TX	01/01/2005 ACT	Q3-H-3 FRACTIONATOR AND Q11-H-3001,3002 HCU DEBUT. REB. AND FRACT. REB.	FUEL GAS			VOC	GOOD COMBUSTION PRACTICES	0.1	LB/H	BACT-PSD
TX-0451	DIAMOND SHAMROCK REFINING VALERO	DIAMOND SHAMROCK REFINING COMPANY LP	TX	05/20/2004 ACT	COMBUSTION UNITS, TANKS, PROCESS VENTS, LOADING, FLARES, FUGITIVES (4), WASTEWATER, COOLING TOWERS				VOC		392.62	LB/H	BACT-PSD
TX-0494	FLINT HILLS RESOURCES INSTALLATION OF BOILERS	FLINT HILLS RESOURCES	TX	01/24/2005 ACT	MISC. COMBUSTION SOURCES				VOC		3564.1499	LB/H	BACT-PSD

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO.1 (EMISSION PT. 15-77)		60.7	MMBTU/H	VOC	98% OF VOC IN FLARE, FLARE IS CONTROL DEVICE.	25.4	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO. 2 (EMISSION PT. 12-81)		60.7	MMBTU/H	VOC	FLARE IS CONTROL DEVICE FOR VOC EMISSIONS. 98% DESTRUCTION OF VOC IN FLARE.	25.4	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	EAST CRUDE EXPANSION FLARE	HYDROGEN AND NATURAL GAS	7.5	MMBTU/H	VOC		0.03	LB/H	BACT-PSD
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	FLARE	NATURAL GAS	0.2	LB/MMBTU	VOC	GOOD COMBUSTION PRACTICE	0.14	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FACILITIES VENTED TO MAIN FLARE- GROUP ONE				VOC	ALL WASTE GAS ROUTED TO FLARE FOR98% CONTROL OF VOC.	226	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FACILITIES VENTING TO MAIN FLARE- GROUP TWO				VOC	ALL WASTE GAS ROUTED TO FLARE FOR98% CONTROL OF VOC.	4013	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	GROUND FLARE				VOC	FLARE	226	LB/H	BACT-PSD
TX-0364	SALT CREEK GAS PLANT	EXXON MOBIL CORPORATION	TX	01/31/2003 ACT	(2) FLARES, EPN 9 & 29				VOC	THE FLARE IS A VOC CONTROL	42.82	LB/H	BACT-PSD
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE				VOC		0.22	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1067)				VOC		7.55	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1087)				VOC		0.14	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (8003B)				VOC		1.21	LB/H	
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	SOUR WATER STRIPPER FLARE				VOC		1.1	LB/H	N/A
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	FLARE-COKE DRUM BLOWDOWN				VOC		27.9	LB/H	BACT-PSD
TX-0492	VIRTEX PETROLEUM COMPANY DOERING RANCH GAS PLANT	VIRTEX PETROLEUM INC.	TX	05/05/2005 ACT	FACILITY FLARE-AMINE UNIT STILL VENT	SWEET NATURAL GAS	0.75	LTPD	VOC		0.72	LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	FLARE 1-5 (15-77, 12-81, 2004-5A, 2004-5B & 2005-38)				VOC	COMPLY WITH 40 CFR 63 SUBPART A	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	ARU FLARE (2008-36)	PROCESS FUEL GAS			VOC	COMPLY WITH 40 CFR 60 SUBPART A	0		BACT-PSD
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	SUNOCO, INC.	OH	02/23/2009 ACT	FLARE, STEAM ASSISTED	PROCESS GASES	155.44	MMBTU/H	VOC	FLARE IS CONTROL FOR HYDROCARBONS	0.84	LB/H	MACT

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO.1 (EMISSION PT. 15-77)		60.7	MMBTU/H	NOx		33.6	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO. 2 (EMISSION PT. 12-81)		60.7	MMBTU/H	NOx		33.6	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	EAST CRUDE EXPANSION FLARE	HYDROGEN AND NATURAL GAS	7.5	MMBTU/H	NOx		0.54	LB/H	BACT-PSD
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	FLARE	NATURAL GAS	0.2	LB/MMBTU	NOx	LIMIT FUEL TO PIPELINE GRADE NATURAL GAS	0.068	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	GROUND FLARE				NOx		75.8	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	MAIN FLARE				NOx		75.8	LB/H	BACT-PSD
TX-0364	SALT CREEK GAS PLANT	EXXON MOBIL CORPORATION	TX	01/31/2003 ACT	(2) FLARES, EPN 9 & 29				NOx	NONE INDICATED	4.37	LB/H	BACT-PSD
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE				NOx		1.14	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1067)				NOx		1.92	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1087)				NOx		1.45	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (8003B)				NOx		1.8	LB/H	
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	SOUR WATER STRIPPER FLARE				NOx		0.36	LB/H	N/A
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	FLARE-COKE DRUM BLOWDOWN				NOx		8.5	LB/H	BACT-PSD
TX-0492	VIRTEX PETROLEUM COMPANY DOERING RANCH GAS PLANT	VIRTEX PETROLEUM INC.	TX	05/05/2005 ACT	FACILITY FLARE-AMINE UNIT STILL VENT	SWEET NATURAL GAS	0.75	LTPD	NOx		0.19	LB/H	BACT-PSD
TX-0494	FLINT HILLS RESOURCES INSTALLATION OF BOILERS	FLINT HILLS RESOURCES	TX	01/24/2005 ACT	FLARES 5,6				NOx		1150.9301	LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	FLARE 1-5 (15-77, 12-81, 2004-5A, 2004-5B & 2005-38)				NOx	COMPLY WITH 40 CFR 63 SUBPART A	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	ARU FLARE (2008-36)	PROCESS FUEL GAS			NOx	COMPLY WITH 40 CFR 60 SUBPART A	0		BACT-PSD
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	SUNOCO, INC.	OH	02/23/2009 ACT	FLARE, STEAM ASSISTED	PROCESS GASES	155.44	MMBTU/H	NOx		15.23	LB/H	N/A

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO.1 (EMISSION PT. 15-77)		60.7	MMBTU/H	CO		149	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO. 2 (EMISSION PT. 12-81)		60.7	MMBTU/H	CO		149	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	EAST CRUDE EXPANSION FLARE	HYDROGEN AND NATURAL GAS	7.5	MMBTU/H	CO		0.2	LB/H	BACT-PSD
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	FLARE	NATURAL GAS	0.2	LB/MMBTU	CO	GOOD COMBUSTION PRACTICE	0.37	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	GROUND FLARE				CO		472	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	MAIN FLARE				CO		472	LB/H	BACT-PSD
TX-0364	SALT CREEK GAS PLANT	EXXON MOBIL CORPORATION	TX	01/31/2003 ACT	(2) FLARES, EPN 9 & 29				CO	NONE INDICATED	37.2	LB/H	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	EAST PROPERTY FLARE				CO		500	PPMV	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	COKER FLARE				CO		500	PPMV	MACT
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	TWO FLARES				CO		500	PPMV	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	NORTH PROPERTY FLARE				CO		500	PPMV	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	CCU FLARE				CO		500	PPMV	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	WEST PROPERTY FLARE				CO		500	PPMV	BACT-PSD
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE				CO		9.77	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1067)				CO		13.84	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1087)				CO		12.42	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (8003B)				CO		3.6	LB/H	
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	ACID GAS FLARE				CO		3.1	LB/H	N/A
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	SOUR WATER STRIPPER FLARE				CO		1.9	LB/H	N/A
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	FLARE-COKE DRUM BLOWDOWN				CO		43.2	LB/H	BACT-PSD
TX-0492	VIRTEX PETROLEUM COMPANY DOERING RANCH GAS PLANT	VIRTEX PETROLEUM INC.	TX	05/05/2005 ACT	FACILITY FLARE-AMINE UNIT STILL VENT	SWEET NATURAL GAS	0.75	LTPD	CO		1.66	LB/H	BACT-PSD
TX-0494	FLINT HILLS RESOURCES INSTALLATION OF BOILERS	FLINT HILLS RESOURCES	TX	01/24/2005 ACT	FLARES 5,6				CO		884.57	LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	FLARE 1-5 (15-77, 12-81, 2004-5A, 2004-5B & 2005-38)				CO	COMPLY WITH 40 CFR 63 SUBPART A	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	ARU FLARE (2008-36)	PROCESS FUEL GAS			CO	COMPLY WITH 40 CFR 60 SUBPART A	0		BACT-PSD

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	SUNOCO, INC.	OH	02/23/2009 ACT	FLARE, STEAM ASSISTED	PROCESS GASES	155.44	MMBTU/H	CO		12.8	LB/H	BACT-PSD

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO.1 (EMISSION PT. 15-77)		60.7	MMBTU/H	SO2		133	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	FLARE NO. 2 (EMISSION PT. 12-81)		60.7	MMBTU/H	SO2		133	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	EAST CRUDE EXPANSION FLARE	HYDROGEN AND NATURAL GAS	7.5	MMBTU/H	SO2		0.1	LB/H	BACT-PSD
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	FLARE	NATURAL GAS	0.2	LB/MMBTU	SO2	USE OF PIPELINE QUALITY NATURAL GAS	0.0006	LB/MMBTU	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	GROUND FLARE				SO2		51.1	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	MAIN FLARE				SO2		51.1	LB/H	BACT-PSD
TX-0364	SALT CREEK GAS PLANT	EXXON MOBIL CORPORATION	TX	01/31/2003 ACT	(2) FLARES, EPN 9 & 29				SO2	NONE INDICATED	50.48	LB/H	Other Case-by-Case
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	EAST PROPERTY FLARE				SO2		300	PPM	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	COKER FLARE				SO2		300	PPM	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	CCU FLARE				SO2		300	PPM	BACT-PSD
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	WEST PROPERTY FLARE				SO2		300	PPM	MACT
TX-0442	SHELL OIL DEER PARK	SHELL OIL COMPANY	TX	07/30/2004 ACT	THREE FLARES				SO2		300	PPM	BACT-PSD
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE				SO2		0.02	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1067)				SO2		0.01	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (1087)				SO2		0.02	LB/H	
TX-0475	FORMOSA POINT COMFORT PLANT	FORMOSA PLASTICS CORPORATION TEXAS	TX	05/09/2005 ACT	FLARE (8003B)				SO2		0.01	LB/H	
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	SOUR WATER STRIPPER FLARE				SO2		0.19	LB/H	N/A
TX-0478	CITGO CORPUS CHRISTI REFINERY - WEST PLANT	CITGO REFINING AND CHEMICALS COMAPNY LP	TX	04/20/2005 ACT	FLARE-COKE DRUM BLOWDOWN				SO2		1056	LB/H	BACT-PSD
TX-0492	VIRTEX PETROLEUM COMPANY DOERING RANCH GAS PLANT	VIRTEX PETROLEUM INC.	TX	05/05/2005 ACT	FACILITY FLARE-AMINE UNIT STILL VENT	SWEET NATURAL GAS	0.75	LTPD	SO2		140.5	LB/H	BACT-PSD
TX-0494	FLINT HILLS RESOURCES INSTALLATION OF BOILERS	FLINT HILLS RESOURCES	TX	01/24/2005 ACT	FLARES 5,6				SO2		942.51	LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	FLARE 1-5 (15-77, 12-81, 2004-5A, 2004-5B & 2005-38)				SO2	USE OF PIPELINE QUALITY NATURAL GAS OR REFINERY FUEL GASES WITH AN H2S CONCENTRATION LESS THAN 100 PPMV (ANNUAL AVERAGE) AS FUELS AT FLARE TIP.	0		BACT-PSD

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	ARU FLARE (2008-36)	PROCESS FUEL GAS			SO2	FUELED BY NATURAL GAS OR PROCESS FUEL GAS WITH H2S <= 10 PPMV (ANNUAL AVERAGE)	0		BACT-PSD

Table C-2 Flare RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	SUNOCO, INC.	OH	02/23/2009 ACT	FLARE, STEAM ASSISTED	PROCESS GASES	155.44	MMBTU/H	SO2		4.2	LB/H	N/A

Table C-3 Fixed Roof Storage Tank RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
FL-0285	PROGRESS BARTOW POWER PLANT	PROGRESS ENERGY FLORIDA (PEF)	FL	01/26/2007 ACT	TWO NOMINAL 3.5 MILLION GALLON DISTILLATE FUEL OIL STORAGE TANKS	FUEL OIL			VOC		0		BACT-PSD
FL-0286	FPL WEST COUNTY ENERGY CENTER	FLORIDA POWER AND LIGHT COMPANY	FL	01/10/2007 ACT	TWO NOMINAL 6.3 MILLION GALLON DISTILLATE FUEL OIL STORAGE TANKS	DISTILLATE FUEL OIL			VOC		0		BACT-PSD
IA-0062	EMERY GENERATING STATION	INTERSTATE POWER & LIGHT (IPL)	IA	12/20/2002 ACT	FUEL STORAGE TANK	#2 FUEL OIL	300000	GAL	VOC	LIMIT TO STORING MATERIALS W/ VAPOR PRESSURE LESS THAN 5.2 KPA ONLY	0.05	T/YR	Other Case-by-Case
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	CORROSION INHIBITOR STORAGE TANK		8500	GALLON STORAGE	VOC		0.85	T/YR	BACT-PSD
LA-0203	OAKDALE OSB PLANT	MARTCO LIMITED PARTNERSHIP	LA	06/13/2005 ACT	10,000 GAL DIESEL TANK				VOC	SUBMERGED FILL PIPE	0.001	LB/H	BACT-PSD
LA-0203	OAKDALE OSB PLANT	MARTCO LIMITED PARTNERSHIP	LA	06/13/2005 ACT	5000 GAL GASOLINE TANKS (2)				VOC	SUBMERGED FILL PIPE	0.15	LB/H	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	FIXED ROOF STORAGE TANKS				VOC	COMPLY WITH 40 CFR 63 SUBPART CC	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	TANKS - FOR HEAVY MATERIALS				VOC	EQUIPPED WITH FIXED ROOF AND COMPLY WITH 40 CFR 63 SUBPART CC	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	TANKS - FOR SPENT CAUSTIC				VOC	FIXED ROOF AND SUBMERGED FILL LINES (LAC 33:III.2103)	0		BACT-PSD
LA-0228	BATON ROUGE JUNCTION FACILITY	COLONIAL PIPELINE COMPANY	LA	11/02/2009 ACT	EQT031-EQT035 FIVE DISTILLATE TANKS (T006-T010)		240000	BBL (EACH)	VOC	SUBMERGED FILL PIPES AND PRESSURE/VACUUM VENTS	45	T/YR	BACT-PSD
LA-0232	STERLINGTON COMPRESSOR STATION	GULF CROSSING PIPELINE CO. LLC.	LA	06/24/2008 ACT	CONDENSATE STORAGE TANK		5760	BBL/YR	VOC	SUBMERGED FILL PIPE	1.28	LB/H	BACT-PSD
LA-0237	ST. ROSE TERMINAL	INTERNATIONAL MATEX TANK TERMINAL (IMTT)	LA	05/20/2010 ACT	HEAVY FUEL OIL STORAGE TANKS (18)		0		VOC	FIXED ROOF	67.53	T/YR	BACT-PSD
OH-0317	OHIO RIVER CLEAN FUELS, LLC	OHIO RIVER CLEAN FUELS, LLC	OH	11/20/2008 ACT	FIXED ROOF TANKS (8)	DIESEL FUEL OIL	262500	GAL/D	VOC	SUBMERGED FILL	0.8	T/YR	BACT-PSD
TX-0389	BAYTOWN CARBON BLACK PLANT	DEGUSSA ENGINEERED CARBONS, LP	TX	12/31/2002 ACT	OIL FEED DAY TANK (4)				VOC		0.01	LB/H	Other Case-by-Case
TX-0389	BAYTOWN CARBON BLACK PLANT	DEGUSSA ENGINEERED CARBONS, LP	TX	12/31/2002 ACT	PLANT FEED OIL TANK VENT 1, 4 (EACH)				VOC		0.08	LB/H	Other Case-by-Case
TX-0389	BAYTOWN CARBON BLACK PLANT	DEGUSSA ENGINEERED CARBONS, LP	TX	12/31/2002 ACT	PLANT FEED OIL TANK, VENT 2				VOC		0.028	LB/T	Other Case-by-Case
TX-0389	BAYTOWN CARBON BLACK PLANT	DEGUSSA ENGINEERED CARBONS, LP	TX	12/31/2002 ACT	PLANT FEED OIL TANK VENT 5				VOC		0.1	LB/H	Other Case-by-Case
TX-0394	DARTCO WAXAHACHIE SITE	DARTCO OF TEXAS	TX	12/20/2002 ACT	FUEL STORAGE TANKS (2)				VOC		0.02	LB/H	Other Case-by-Case
TX-0464	CONTINENTAL CARBON SUNRAY PLANT	CONTINENTAL CARBON COMPANY	TX	03/18/2005 ACT	SMALL STORAGE TANK				VOC	THE FIXED ROOF TANKS ARE CONSIDERED BACT DUE TO THE LOW VAPOR PRESSURE OF THE FEEDSTOCK OIL.	0.01	LB/H	BACT-PSD
TX-0464	CONTINENTAL CARBON SUNRAY PLANT	CONTINENTAL CARBON COMPANY	TX	03/18/2005 ACT	LARGE STORAGE TANK				VOC	THE FIXED ROOF TANKS ARE CONSIDERED BACT DUE TO THE LOW VAPOR PRESSURE OF THE FEEDSTOCK OIL.	0.01	LB/H	BACT-PSD
TX-0481	AIR PRODUCTS BAYTOWN II	AIR PRODUCTS LP	TX	11/02/2004 ACT	DIESEL FUEL TANK				VOC		0.01	LB/H	N/A

Table C-3 Fixed Roof Storage Tank RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0481	AIR PRODUCTS BAYTOWN II	AIR PRODUCTS LP	TX	11/02/2004 ACT	DIESEL FUEL TANK				VOC		0.01	LB/H	N/A
WI-0227	PORT WASHINGTON GENERATING STATION	WE ENERGIES (WEPCO)	WI	10/13/2004 ACT	FUEL OIL STORAGE TANK (T01)	DISTILLATE FUEL OIL			VOC	FIXED ROOF TANK WITH SUBMERGED FILL PIPE. TANK MAY ONLY BE USED TO STORE DISTILLATE FUEL OIL	0		BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	FIXED ROOF STORAGE TANKS				VOC	COMPLY WITH 40 CFR 63 SUBPART CC	0		BACT-PSD

Table C-3 Floating Roof Storage Tank RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	GROUP A STORAGE TANKS				VOC	THE EMISSIONS FROM GROUP A STORAGE TANKS MUST BE COLLECTED BY A VAPOR COMPRESSION SYSTEM AND ROUTED TO THE REFINERY FUEL GAS SYSTEM. NO EMISSIONS ARE PERMITTED TO BE RELEASED INTO THE AIR EXCEPT FOR EQUIPMENT LEAKS.	0		BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	GROUP D STORAGE TANKS				VOC	THE TANKS ARE REQUIRED TO BE UNDER PRESSURE SO THAT NO EMISSIONS ARE EMITTED TO THE ATMOSPHERE.	0		BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	GROUP B STORAGE TANKS				VOC	INTERNAL FLOATING ROOFS WITH HEADSPACE ROUTED TO THE TANK FARM THERMAL OXIDIZER.	0		
*CA-1180	CHEVRON PRODUCTS CO	CHEVRON PRODUCTS CO	CA	08/24/2011 ACT	Recovered oil storage tank, external floating roof with dome		0		VOC	Requires domes on external floating roof tanks.	0		OTHER CASE-BY-CASE
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	DENATURED ETHANOL STORAGE TANK		2000000	GALLON STORAGE	VOC	INTERNAL FLOATING ROOF	1.26	T/YR	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	ALCOHOL DAY TANK (200 PROOF)		500000	GALLON STORAGE	VOC	INTERNAL FLOATING ROOF	1.14	T/YR	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	ALCOHOL QUALITY CONTROL TANK		500000	GALLON STORAGE	VOC	INTERNAL FLOATING ROOF	1.22	T/YR	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	ALCOHOL RECLAIM TANK		500000	GALLON STORAGE	VOC	INTERNAL FLOATING ROOF	1.22	T/YR	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	DENATURANT STORAGE TANK		500000	GALLON STORAGE	VOC	INTERNAL FLOATING ROOF	0.51	T/YR	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	CORROSION INHIBITOR STORAGE TANK		8500	GALLON STORAGE	VOC		0.85	T/YR	BACT-PSD
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	ARCHER DANIELS MIDLAND	IA	06/29/2007 ACT	190 PROOF TANK		100000	GALLON STORAGE	VOC	INTERNAL FLOATING ROOF	3.18	T/YR	BACT-PSD
IA-0089	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	IA	08/08/2007 ACT	DENATURED ETHANOL STORAGE TANK, T61 AND T62 (07-A-972P AND 07-A-973P)		1500000	GAL	VOC	INTERNAL FLOATING ROOF	0.36	T/YR	BACT-PSD
IA-0089	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	IA	08/08/2007 ACT	200 PROOF ANYHDROUS ETHANOL STORAGE TANK, T63 (07-A-974P)		200000	GAL	VOC	INTERNAL FLOATING ROOF	0.61	T/YR	BACT-PSD
IA-0089	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	IA	08/08/2007 ACT	DENATURANT STORAGE TANK, T64 (07-A-975P)		200000	GAL	VOC	INTERNAL FLOATING ROOF	1.49	T/YR	BACT-PSD
IA-0089	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	IA	08/08/2007 ACT	190-PROOF ETHANOL STORAGE TANK, T65 (07-A-976P)		200000	GAL	VOC	INTERNAL FLOATING ROOF	0.61	T/YR	BACT-PSD
IA-0089	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	IA	08/08/2007 ACT	ADDITIVE (CORROSION INHIBITOR) TANK, T66 (07-A-977P)		2300	GAL	VOC		0.05	T/YR	BACT-PSD

Table C-3 Floating Roof Storage Tank RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
IA-0095	TATE & LYLE INDGREDIENTS AMERICAS, INC.		IA	09/19/2008 ACT	ALCOHOL QC TANK				VOC	INTERNAL FLOATING ROOF	0.28	T/YR	BACT-PSD
IA-0095	TATE & LYLE INDGREDIENTS AMERICAS, INC.		IA	09/19/2008 ACT	ETHANOL STORAGE TANKS (2)				VOC	INTERNAL FLOATING ROOF	0		BACT-PSD
IA-0095	TATE & LYLE INDGREDIENTS AMERICAS, INC.		IA	09/19/2008 ACT	GASOLINE STORAGE TANK				VOC	INTERNAL FLOATING ROOF	0		BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	EXTERNAL FLOATING ROOF STORAGE TANKS				VOC	EXTERNAL FLOATING ROOFS; COMPLY WITH 40 CFR 63 SUBPART CC	0		BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	INTERNAL FLOATING ROOF STORAGE TANKS				VOC	INTERNAL FLOATING ROOFS; COMPLY WITH 40 CFR 63 SUBPART CC	0		BACT-PSD
LA-0212	ZACHARY STATION	MARATHON PIPE LINE LLC	LA	02/01/2007 ACT	11.75 MM GAL GASOLINE/DISTILLATES TANKS (T-1 & T-14)		423	MM GALS/YR	VOC	INTERNAL FLOATING ROOFS	3.16	LB/H	BACT-PSD
LA-0212	ZACHARY STATION	MARATHON PIPE LINE LLC	LA	02/01/2007 ACT	6.61 MM GAL GASOLINE/DISTILLATES TANK (T-4)		238	MM GALS/YR	VOC	INTERNAL FLOATING ROOF	2.17	LB/H	BACT-PSD
LA-0212	ZACHARY STATION	MARATHON PIPE LINE LLC	LA	02/01/2007 ACT	6.61 MM GAL GASOLINE/DISTILLATES TANK (T-9)		238	MM GALS/YR	VOC	INTERNAL FLOATING ROOF	2.11	LB/H	BACT-PSD
LA-0212	ZACHARY STATION	MARATHON PIPE LINE LLC	LA	02/01/2007 ACT	394,813 GAL TRANSMIX TANK (T-13)		14.21	MM GALS/YR	VOC	INTERNAL FLOATING ROOF	0.66	LB/H	BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	TANKS - FOR BENZENE, XYLENE, SULFOLANE, PAREX, INTERMEDIATE				VOC	EQUIPPED WITH INTERNAL FLOATING ROOFS FOLLOWED BY THERMAL OXIDIZERS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	TANKS - FOR LIGHT MATERIALS, SOUR WATER, NAPHTHA, RAFFINATE				VOC	EQUIP WITH FLOATING ROOFS (IFR OR EFR) & COMPLY WITH 40 CFR 60 SUBPART KB OR 40 CFR 63 SUBPART CC	0		BACT-PSD
LA-0228	BATON ROUGE JUNCTION FACILITY	COLONIAL PIPELINE COMPANY	LA	11/02/2009 ACT	EQT026-EQT030 FIVE GASOLINE TANKS (T001-T005)		240000	BBL (EACH)	VOC	INTERNAL FLOATING ROOFS AND SUBMERGED FILL PIPES	59.7	T/YR	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STORAGE TANKS	NAPTHA	100000	BBL	VOC	EXTERNAL FLOATING ROOF TANK EQUIPPED WITH DOUBLE SEALS .	0		BACT-PSD
OH-0317	OHIO RIVER CLEAN FUELS, LLC	OHIO RIVER CLEAN FUELS, LLC	OH	11/20/2008 ACT	INTERNAL FLOATING ROOF TANKS (4)	NAPHTHA	262500	GAL/D	VOC	FLOATING ROOF AND SUBMERGED FILL	0.88	T/YR	BACT-PSD
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	TANKS			VARIES	VOC	REFINERY MACT REQUIRES CERTAIN CONTROL DEVICES WHICH ARE INSTALLED ON THE STORAGE TANKS.	0		Other Case-by-Case
OK-0139	CUSHING TERMINAL CRUDE OIL STORAGE FACILITY	PLAINS MARKETING LP	OK	10/25/2010 ACT	Crude Oil Storage in External Floating Roof Tanks	NA	570000	Barrels	VOC	No controls feasible ; external floating roof tanks.	437.35	TONS	BACT-PSD
TX-0487	ROHM AND HAAS CHEMICALS LLC LONE STAR PLANT	ROHM AND HAAS TEXAS INCORPORATION	TX	03/24/2005 ACT	ALCOHOL TANK (3)				VOC		0.01	LB/H	BACT-PSD
WI-0248	ENBRIDGE ENERGY	ENBRIDGE ENERGY	WI	09/22/2008 ACT	TANKS T05, T09				VOC	EXTERNAL FLOATING ROOF TANK	0.49	T/MO.	BACT-PSD

Table C-3 Floating Roof Storage Tank RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
WI-0249	ENBRIDGE ENERGY	ENBRIDGE ENERGY	WI	08/22/2008 ACT	TANK T35				VOC	EXTERNAL FLOATING ROOF TANK	0.53	T/MO	BACT-PSD
WI-0251	ENBRIDGE ENERGY	ENBRIDGE ENERGY	WI	07/21/2009 ACT	T36-T40 CRUDE OIL STORAGE TANKS				VOC	EXTERNAL FLOATING ROOF TANK	0.53	T/VOC/MO.	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	EXTERNAL FLOATING ROOF STORAGE TANKS				VOC	EXTERNAL FLOATING ROOFS; COMPLY WITH 40 CFR 63 SUBPART CC	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	TANKS - FOR BENZENE, XYLENE, SULFOLANE, PAREX, INTERMEDIATE				VOC	EQUIPPED WITH INTERNAL FLOATING ROOFS FOLLOWED BY THERMAL OXIDIZERS	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	TANKS - FOR LIGHT MATERIALS, SOUR WATER, NAPHTHA, RAFFINATE				VOC	EQUIP WITH FLOATING ROOFS (IFR OR EFR) & COMPLY WITH 40 CFR 60 SUBPART KB OR 40 CFR 63 SUBPART CC	0		BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	STORAGE TANKS	NAPTHA	100000	BBL	VOC	EXTERNAL FLOATING ROOF TANK EQUIPPED WITH DOUBLE SEALS .	0		BACT-PSD
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	TANKS			VARIES	VOC	REFINERY MACT REQUIRES CERTAIN CONTROL DEVICES WHICH ARE INSTALLED ON THE STORAGE TANKS.	0		Other Case-by-Case
OK-0102	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	08/18/2004 ACT	TANK T-1101				VOC	REFINERY MACT: INTERNAL FLOATING ROOF TANK WITH 2 VAPOR MOUNTED SEALS OR A MECHANICAL SHOE	0		BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	TANKS	GASOLINE	60000	GAL/H	VOC	INTERNAL FLOATING ROOF, MONTHLY EMISSIONS RECORD	4013	LB/H	BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	TANKS	GASOLINE	60000	GAL/H	Benzene		26	LB/H	BACT-PSD

Table C-4 Fugitive RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
IL-0073	EXXONMOBIL OIL CORPORATION	EXXONMOBIL OIL CORPORATION	IL	08/19/2003 ACT	FUGITIVES	VOC		3.76	T/YR	LAER
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	EQUIPMENT LEAKS	VOC		0		BACT-PSD
IL-0103	CONOCOPHILLIPS WOOD RIVER REFINERY	CONOCOPHILLIPS	IL	08/05/2008 ACT	COMPONENTS (CONNECTORS, VALVES, PUMP SEALS, ETC.)	VOC	COMPLIANCE WITH LEAK DETECTION AND REPAIR PROGRAM PURSUANT TO 40 CFR 63, SUBPART H.	0		LAER
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	SUNOCO, INC.	OH	02/23/2009 ACT	LEAK DETECTION AND REPAIR (LDAR) PROGRAM	VOC	LEAK DETECTION AND REPAIR PROGRAM	385.43	T/YR	MACT
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FUGITIVES	VOC	EMISSIONS ARE ESTIMATES, NOT MAXIMUM ALLOWABLE RATES. SPECIAL CONDITIONS APPLY FOR MAINTENANCE AND COMPLIANCE OF EQUIPMENT RELATED TO FUGITIVE EMISSIONS OF VOC, SEE PERMIT.	1655	LB/H	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	FUGITIVE EMISSIONS	VOC	LDAR PROGRAM: COMPLY WITH OVERALL MOST STRINGENT PROGRAM APPLICABLE TO UNIT. APPLICABLE PROGRAMS INCLUDE 40 CFR 63 SUBPART CC, 40 CFR 60 SUBPART GGG, LAC 33:III.2121, & LAC 33:III.CHAPTER 51 (LA REFINERY MACT).	0		BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	HYDROGEN PLANT FUGITIVES (51-08)	VOC	LDAR PROGRAM: LAC 33:III.2121	0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	FUGITIVE EMISSIONS	VOC	REFINERY (90-0): LA REFINERY MACT LDAR PROGRAM; ARU (2008-39): MONITORING ACCORDING TO 40 CFR 63 SUBPART H; ARU LOADING (2008-37): MONITORING ACCORDING TO 40 CFR 61 SUBPART V	0		BACT-PSD
LA-0225	NORCO REFINERY	MOTIVA ENTERPRISES LLC	LA	03/25/2008 ACT	HYDROCRACKER UNIT FUGITIVE EMISSIONS 3011-95	VOC	40 CFR 60 SUBPART GGG, 40 CFR 63 SUBPART CC, LOUISIANA MACT DETERMINATION FOR REFINERY EQUIPMENT LEAKS JULY 26, 1994	100.4	T/YR	BACT-PSD
LA-0225	NORCO REFINERY	MOTIVA ENTERPRISES LLC	LA	03/25/2008 ACT	DIESEL HYDROTREATER UNIT FUGITIVE EMISSIONS 5011-99	VOC	40 CFR 60 SUBPART GGG, 40 CFR 63 SUBPART CC, LOUISIANA MACT DETERMINATION FOR REFINERY EQUIPMENT LEAKS JULY 26, 1994	67.51	T/YR	BACT-PSD
LA-0225	NORCO REFINERY	MOTIVA ENTERPRISES LLC	LA	03/25/2008 ACT	DISTILLING UNIT FUGITIVE EMISSIONS 3004-95	VOC	40 CFR 60 SUBPART GGG, 40 CFR 63 SUBPART CC, LOUISIANA MACT DETERMINATION FOR REFINERY EQUIPMENT LEAKS JULY 26, 1994	182.63	T/YR	BACT-PSD
LA-0225	NORCO REFINERY	MOTIVA ENTERPRISES LLC	LA	03/25/2008 ACT	CATALYTIC REFORMER NO. 2 UNIT FUGITIVE EMISSIONS 3010-95	VOC	40 CFR 60 SUBPART GGG, 40 CFR 63 SUBPART CC, LOUISIANA MACT DETERMINATION FOR REFINERY EQUIPMENT LEAKS JULY 26, 1994	120.57	T/YR	BACT-PSD
LA-0225	NORCO REFINERY	MOTIVA ENTERPRISES LLC	LA	03/25/2008 ACT	HYDROGEN PLANT FUGITIVE EMISSIONS 5011-99	VOC	40 CFR 63 SUBPART CC, LOUISIANA MACT DETERMINATION FOR REFINERY EQUIPMENT LEAKS JULY 26, 1994	15.41	T/YR	BACT-PSD

Table C-4 Fugitive RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0245	HYDROGEN PLANT	VALERO REFINING - NEW ORLEANS, LLC	LA	12/15/2010 ACT	Hydrogen Plant Fugitives (FUG0030)	VOC	LDAR program that meets LA Refinery MACT with Consent Decree Enhancements (July 26, 1994)	23.74	T/YR	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	FUGITIVE EQUIPMENT COMPONENTS	VOC		0		BACT-PSD
OH-0308	SUN COMPANY, INC., TOLEDO REFINERY	SUNOCO, INC.	OH	02/23/2009 ACT	LEAK DETECTION AND REPAIR (LDAR) PROGRAM	VOC	LEAK DETECTION AND REPAIR PROGRAM	385.43	T/YR	MACT
OK-0059	PONCA CITY REFINERY	CONOCO INC	OK	07/01/2002 ACT	FUGITIVE COMPONENTS/EQUIPMENT LEAKS	VOC	REFINERY MACT REQUIRES INSPECTION AND MAINTENANCE OF PUMP SEALS, VALVES, FLANGES, AND PIPES.	0		BACT-PSD
OK-0089	TPI PETROLEUM INC., VALERO ARDMORE REFINERY	TPI PETROLEUM INC.	OK	06/09/2003 ACT	CRUDE UNIT FUGITIVE EMISSIONS	VOC	LEAK DETECTION AND REPAIR (OVA & METHOD 21)	10000	PPM	BACT-PSD
OK-0092	VALERO ARDMORE REFINERY	TPI PETROLEUM	OK	01/13/2003 ACT	CRUDE UNIT FUGITIVE EMISSIONS	VOC	LEAK DETECTION AND REPAIR PROGRAM	0		N/A
OK-0102	PONCA CITY REFINERY	CONOCOPHILLIPS	OK	08/18/2004 ACT	EQUIPMENT LEAKS	VOC	REFINERY MACT II STANDARDS (LDAR): LEAK DETECTION, MONITORING	0		BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	FUGITIVES	VOC	EMISSIONS ARE ESTIMATES, NOT MAXIMUM ALLOWABLE RATES. SPECIAL CONDITIONS APPLY FOR MAINTENANCE AND COMPLIANCE OF EQUIPMENT RELATED TO FUGITIVE EMISSIONS OF VOC, SEE PERMIT.	1655	LB/H	BACT-PSD
TX-0379	EXXONMOBIL BEAUMONT REFINERY	EXXONMOBIL OIL CORPORATION	TX	06/10/2002 ACT	FCCU FUGITIVES	VOC	FOLLOW PROCEDURES FOR LEAK PREVENTION, DETECTION, AND REPAIR.	9.84	LB/H	Other Case-by-Case
TX-0492	VIRTEX PETROLEUM COMPANY DOERING RANCH GAS PLANT	VIRTEX PETROLEUM INC.	TX	05/05/2005 ACT	FUGITIVES (4)	VOC		0.88	LB/H	BACT-PSD

Table C-5 Truck Loading RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	TANK TRUCK/RAIL CAR LOADING				VOC	NOT SUBJECT TO BACT, ALL LOW PRESSURE MATERIALS	261	LB/H	BACT-PSD
NM-0050	ARTESIA REFINERY	NAVAJO REFINING COMPANY LLC	NM	12/14/2007 ACT	TRUCK LOADING RACK				VOC	CARBON ADSORPTION SYSTEM	10	MG/L	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	TRUCK AND RAIL CAR LOADING RACK REGENERATIVE ADSORPTION SYSTEMS				VOC	THERMAL OXIDIZERS	0		BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	TRUCK AND RAIL CAR LOADING RACK THERMAL OXIDIZERS	REFINERY FUEL GAS OR NATURAL GAS	12.3	MMBTU/H	VOC		1.25	LB/MM GAL	BACT-PSD
AZ-0046	ARIZONA CLEAN FUELS YUMA	ARIZONA CLEAN FUELS YUMA LLC	AZ	04/14/2005 ACT	GASOLINE PRODUCT TRUCK LOADING RACKS				VOC	VAPOR COLLECTION SYSTEM, REGENERATIVE ADSORPTION SYSTEM AND TRUCK LOADING RACK THERMAL OXIDIZER	0		BACT-PSD

Table C-5 Marine Loading RBLC Search Results for VOC Emissions

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Throughput	Throughput Units	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	MARINE TANK VESSEL LOADING OPERATIONS			VOC	HIGH VAPOR PRESSURE MATERIAL (>1.5 PSIA) LOADED WITH VAPORS DIRECTED TO THERMAL OXIDIZER FOR VOC DESTRUCTION	512	LB/H	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	MARINE/BARGE LOADING OPERATIONS (134-96)	65081	BBL/H	VOC		0		BACT-PSD
TX-0235	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	VALERO REFINING COMPANY- CORPUS CHRISTI REFINERY	TX	06/11/2002 ACT	MARINE LOADING (BARGE AND SHIP)	35000	BBL/H	VOC	EMISSIONS FROM LOADING OF HIGH VAPOR PRESSURE LIQUIDS (>0.5 PSIA) ARE ROUTED TO MVRU; UNCONTROLLED LOADING OF LOW VAPOR PRESSURE LIQUIDS; BARGE LOADING CONDUCTED UNDER VACUUM	1655	LB/H	BACT-PSD
LA-0211	GARYVILLE REFINERY	MARATHON PETROLEUM CO LLC	LA	12/27/2006 ACT	MARINE/BARGE LOADING OPERATIONS (134-96)	65081	BBL/H	VOC		0		BACT-PSD
LA-0213	ST. CHARLES REFINERY	VALERO REFINING - NEW ORLEANS, LLC	LA	11/17/2009 ACT	PETROLEUM PRODUCT LOADING DOCKS (94-9)			VOC	COMPLY WITH LAC 33:III.2108 FOR LOADING MATERIALS WITH VAPOR PRESSURE > 1.5 PSIA	687	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	PETROLEUM PRODUCTS LOADING DOCKS			VOC	HIGH VAPOR PRESSURE MATERIAL (>1.5 PSIA) LOADED WITH VAPORS IS DIRECTED TO THE MARINE VAPOR RECOVERY THERMAL OXIDIZER FOR VOC DESTRUCTION	687	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	MARINE TANK VESSEL LOADING OPERATIONS			NOx	NONE INDICATED	28	LB/H	BACT-PSD
LA-0166	ORION REFINING CORP (NOW VALERO)	ORION REFINING CORP (NOW VALERO)	LA	01/10/2002 ACT	MARINE TANK VESSEL LOADING OPERATIONS			SO2	NONE INDICATED	3.3	LB/H	BACT-PSD

Table C-6 MSS RBLC Search Results for Criteria Pollutants

RBLC ID	Facility Name	Corporate or Company Name	Facility State	Permit Issuance Date	Process Name	Pollutant	Control Method Description	Emission Limit 1	Emission Limit Units	Case-by-Case Basis
TX-0574	VALERO THREE RIVERS REFINERY	DIAMOND SHAMROCK REFINING COMPANY L.P.	TX	08/19/2010 ACT	MSS FOR PROCESS EQUIPMENT AND STORAGE TANKS	CO	BEST PRACTICES	0		BACT-PSD
TX-0574	VALERO THREE RIVERS REFINERY	DIAMOND SHAMROCK REFINING COMPANY L.P.	TX	08/19/2010 ACT	MSS FOR PROCESS EQUIPMENT AND STORAGE TANKS	SO2	BEST PRACTICES	0		BACT-PSD
TX-0574	VALERO THREE RIVERS REFINERY	DIAMOND SHAMROCK REFINING COMPANY L.P.	TX	08/19/2010 ACT	MSS FOR PROCESS EQUIPMENT AND STORAGE TANKS	VOC	VENT TO CONTROL UNTIL VOC CONCENTRATION < 10,000 PPMV	0		BACT-PSD
TX-0592	CORPUS CHRISTI WEST REFINERY	VALERO REFINING-TEXAS LP	TX	03/29/2010 ACT	Tanks	VOC	Land roof <24 hr without control, drain and degas to control until no standing liquid in the tank is left and VOC concentration less than 10,000 ppmv, vent to control when refilling landed tank until tank roof floating again to minimize impacts	1027	LB/H	OTHER CASE-BY-CASE
TX-0595	CORPUS CHRISTI EAST REFINERY	VALERO REFINING-TEXAS LP	TX	08/19/2010 ACT	Tanks	VOC	Land roof and keep it landed no more than 24 hrs without control, drain and degas to control until no standing liquid remains in the tank and the VOC<10,0000 ppmv in the vent stream. During refilling, vent to control until tank roof is floating to minimize impacts.	1482	LB/H	OTHER CASE-BY-CASE
VA-0313	TRANSMONTAIGNE NORFOLK TERMINAL	TRANSMONTAIGNE OPERATING COMPANY LP	VA	04/22/2010 ACT	Storage Tank Breathing, Working, and Floating Roof Landing Losses (including emergency roof landings)	VOC	Floating Roof and Seal Systems meeting NSPS Kb, MACT BBBBBB requirements for Tanks in Gasoline Service	114.1	T/YR	OTHER CASE-BY-CASE
TX-0592	CORPUS CHRISTI WEST REFINERY	VALERO REFINING-TEXAS LP	TX	03/29/2010 ACT	Temporary Tanks (Frac Tanks)	VOC	Submerged filled, white tanks <25,000 gallon capacity	64	LB/H	OTHER CASE-BY-CASE
TX-0595	CORPUS CHRISTI EAST REFINERY	VALERO REFINING-TEXAS LP	TX	08/19/2010 ACT	Temporary Tanks (Frac Tanks)	VOC	Submerge filled white tanks with<25,000 gallon capacity	64	LB/H	OTHER CASE-BY-CASE
TX-0592	CORPUS CHRISTI WEST REFINERY	VALERO REFINING-TEXAS LP	TX	03/29/2010 ACT	Vacuum Trucks	VOC	If vacuum trucks are used when transferring liquid with vapor pressure>0.5 psi, exhaust must be routed to a control device with at least 98% DRE, minimize air entrainment in all cases.	10.5	LB/H	OTHER CASE-BY-CASE
TX-0595	CORPUS CHRISTI EAST REFINERY	VALERO REFINING-TEXAS LP	TX	08/19/2010 ACT	Vacuum Trucks	VOC	If vacuum trucks are used when transferring liquid with VP>0.5 psi, exhaust must be routed to a control device such as flare with at least 98% DRE, minimize air entrainment in all cases.	6.3	LB/H	OTHER CASE-BY-CASE

Appendix D

TCEQ Permit Tables

TABLE 2
MATERIAL BALANCE

This material balance table is used to quantify possible emissions of air contaminants and special emphasis should be placed on potential air contaminants, for example: If feed contains sulfur, show distribution to all products. Please relate each material (or group of materials) listed to its respective location in the process flow diagram by assigning point numbers (taken from the flow diagram) to each material.

LIST EVERY MATERIAL INVOLVED IN EACH OF THE FOLLOWING GROUPS	Point No. from Flow Diagram	Process Rate (lbs/hr or SCFM) standard conditions: 70°F 14.7 PSIA. Check appropriate column at right for each process.	Measurement	Estimation	Calculation
1. Raw Materials - Input **Condensate**		**1,150,484 lb/hr**		**X**	
2. Fuels Input **Natural Gas**		**7,369 scfm**		X	
3. Products & By-Products - Output **Heavy Naphtha** **Light Naphtha** **Kerosene/Diesel** **Y-Grade**		**106,978 lb/hr** **322,320 lb/hr** **697,744 lb/hr** **21,354 lb/hr**		**X** **X** **X** **X**	
4. Solid Wastes - Output **Maintenance wastes**		**TBD lb/hr**		**X**	
5. Liquid Wastes - Output **Wastewater effluent**		**50 gpm**		**X**	
6. Airborne Waste (Solid) - Output **PM/PM10/PM2.5**		**See Table 1(a)**		**X**	
7. Airborne Wastes (Gaseous) - Output **NO_x, SO_2, CO, VOC, NH_3**		**See Table 1(a)**		**X**	

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Note: Throughput rates are representative of expected operations and should not be considered enforceable limits.