



PERMIT AMENDMENT APPLICATION
Equistar Chemicals, L.P. > La Porte Site

LB-1 Unit
Permit No. 114809 and N190

Prepared By:

TRINITY CONSULTANTS
1800 W Loop S
Suite 1000
Houston, Texas 77027
(713) 552-1371

May 2019

Project 194402.0086



Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	1-1
2. TCEQ FORMS	2-1
3. AREA MAP	3-1
4. PLOT PLAN	4-1
5. PROCESS DESCRIPTION	5-1
6. PROCESS FLOW DIAGRAM	6-1
7. EMISSION CALCULATIONS	7-1
7.1. Flare Emissions (EPN: LBFLARE).....	7-1
7.2. MSS Emissions (EPN: MSS-LB1-VAC)	7-1
8. LOWEST ACHIEVABLE EMISSION RATE (LAER)	8-1
8.1. Flare VOC LAER Analysis	8-1
8.2. Vacuum Truck VOC LAER Analysis.....	8-1
9. BEST AVAILABLE CONTROL TECHNOLOGY	9-2
9.1. BACT for Flare (NO _x , CO, and SO ₂)	9-2
10. FEDERAL NEW SOURCE REVIEW ANALYSIS	10-1
10.1. NNSR Applicability.....	10-2
10.1.1. Alternative Site Analysis.....	10-2
10.1.2. Compliance Review.....	10-2
10.2. PSD Applicability.....	10-2
11. GENERAL APPLICATION REQUIREMENTS	11-1
12. PERMIT FEE	12-1
APPENDIX A: RBLC RESULTS	A-1
APPENDIX B: FEDERAL NSR TABLES	B-1
APPENDIX C: REQUESTED CHANGES TO SPECIAL CONDITIONS	C-1
APPENDIX D: IMPACTS ANALYSIS	D-1
APPENDIX E: PLOT PLAN	E-1
APPENDIX F: PROCESS FLOW DIAGRAM	F-1
APPENDIX G: DETAILED EMISSIONS CALCULATIONS	G-1
APPENDIX H: MATERIAL BALANCE	H-1

LIST OF TABLES

Table 1-1. Summary of Emissions Changes	1-2
Table 1-2. MAERT Emission Limit Changes	1-2
Table 7-1. Flare Emissions Summary	7-1
Table 10-1. Project Emission Increases for FNSR Analysis Summary	10-2

1. EXECUTIVE SUMMARY

LyondellBasell owns and operates a chemical manufacturing complex in La Porte, Harris County, Texas (La Porte Complex). The complex is divided into two operating areas and each area operates under a unique Texas Commission on Environmental Quality (TCEQ) Customer Reference Number (CN) and Regulated Entity Reference Number (RN):

- Olefins Unit and Polymers Units operated by Equistar Chemicals, LP (RN: 100210319, CN: 600124705), and
- Glacial Acetic Acid and Vinyl Acetate Monomer Units operated by LyondellBasell Acetyls, LLC (RN: 100224450, CN: 603674862)

For the purpose of federal regulatory applicability, the Equistar Facility and Acetyls Facility are contiguous and under common control and hence considered as one site in this permit application. The combined La Porte Complex is an existing major source, located in the Houston-Galveston-Brazoria (HGB) area. The site is a major source of volatile organic compounds (VOC), carbon monoxide (CO), nitrogen oxides (NO_x), nitrogen dioxide (NO₂), particulate matter (PM), hazardous air pollutants (HAPs), and greenhouse gases (GHGs). At the time of initial application, and at the time of initial permit issuance, the HGB area was designated as severe non-attainment for ozone.¹

NSR Permit 114809 and N190 authorizes routine and MSS emissions from the LB-1 Unit. The LB-1 Unit will produce polyethylene solids. Since the issuance of the permit on February 19, 2016, design changes have occurred which will affect air emissions. This permit amendment application seeks to:

- Increase emissions from the Q1 Unit routed to the LB-1 Flare (EPN LBFLARE);
- Incorporate PBR Registration 153695;
- Revise several special conditions in the current permit;
- Authorize additional MSS control device types; and
- Authorize the use of vacuum trucks during MSS activities.

The La Porte Site is in a nonattainment area for ozone and the original project triggered Nonattainment New Source Review (NNSR) for VOC. Prevention of Significant Deterioration (PSD) review was not triggered for any criteria pollutant. This amendment results in changes as included in the table below. It does not change the NNSR or PSD applicability for the project.

¹ The United States Environmental Protection Agency (U.S. EPA) Green Book.
<https://www3.epa.gov/airquality/greenbook/ancl.html> (Accessed August 2011)

Table 1-1. Summary of Emissions Changes

Air Contaminant	Change (tpy)
VOC	8.95
NOx	5.64
CO	28.79
SO2	-1.53
PM/PM ₁₀ /PM _{2.5}	No Change

The table below represents the requested changes.

Table 1-2. MAERT Emission Limit Changes

Emission Point No.	Source Name	Air Contaminant	Emission Rates	
			lb/hour	TPY
LBFLARE	LB-1 Flare	CO	307.58 303.38	43.21 42.59
		NOx	66.34 65.53	8.79 8.68
		SO2	0.43	0.12 1.86
		VOC	453.11 447.21	40.14 39.55
	MSS Flaring	CO	368.17	34.71 6.55
		NOx	73.74	6.84 1.31
		VOC	481.76	16.90 8.70
MSS-LB1-VAC	LB-1 Vacuum Trucks	VOC	1.66	0.16

The required TCEQ Form PI-1 and the Emissions Point Summary [TCEQ Table 1(a)] are included in Section 2. The area map and plot plan of the facility is provided in Sections 3 and 4, respectively. A detailed process description is provided in Section 5, along with the process flow diagram (PFD) in Section 6. Description of methods used to calculate emissions is provided in Section 7. The Lowest Achievable Emission Rate (LAER) and Best Available Control Technology (BACT) analyses are provided in Sections 8 and 9. A detailed NNSR/PSD applicability analysis is provided in Section 10. The general application requirements are addressed in Section 11. Application fee requirements for the permit are addressed in Section 12. In addition, the following information is provided in the attached appendices of this permit amendment application:

- > Appendix A – RBLC Results
- > Appendix B - Federal NSR Tables
- > Appendix C – Requested Changes to Special Conditions
- > Appendix D - Impacts Analysis
- > Appendix E – Plot Plan (**CONFIDENTIAL**)
- > Appendix F – Process Flow Diagram (**CONFIDENTIAL**)
- > Appendix G – Detailed Emissions Calculations (**CONFIDENTIAL**)
- > Appendix H – Material Balance (**CONFIDENTIAL**)

2. TCEQ FORMS

TCEQ Form PI-1 Table 1(A)

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

Date: _____
Permit #: _____
Company: _____

I. Applicant Information	
<p style="color: red; margin: 0;">I acknowledge that I am submitting an authorized TCEQ application workbook and any necessary attachments. Except for inputting the requested data and adjusting row height and column width, I have not changed the TCEQ application workbook in any way, including but not limited to changing formulas, formatting, content, or protections.</p>	I agree
A. Company Information	
Company or Legal Name:	Equistar Chemicals, LP
<p>Permits are issued to either the facility owner or operator, commonly referred to as the applicant or permit holder. List the legal name of the company, corporation, partnership, or person who is applying for the permit. We will verify the legal name with the Texas Secretary of State at (512) 463-5555 or at:</p> <p>https://www.sos.state.tx.us</p>	
Texas Secretary of State Charter/Registration Number (if given):	
B. Company Official Contact Information: must not be a consultant	
Prefix (Mr., Ms., Dr., etc.):	Mr
First Name:	Christopher
Last Name:	Cain
Title:	Site Manager
Mailing Address:	P. O . Drawer D
Address Line 2:	
City:	Deer Park
State:	TX
ZIP Code:	77536-1900
Telephone Number:	713-336-5475
Fax Number:	
Email Address:	Christopher.Cain@lyondellbasell.com
C. Technical Contact Information: This person must have the authority to make binding agreements and representations on behalf of the applicant and may be a consultant. Additional technical contact(s) can be provided in a cover letter.	
Prefix (Mr., Ms., Dr., etc.):	Ms.
First Name:	Phyllis
Last Name:	Rodriguez
Title:	Environmental Department
Company or Legal Name:	Equistar Chemicals, LP
Mailing Address:	
Address Line 2:	P. O . Drawer D
City:	Deer Park
State:	TX
ZIP Code:	77536-1900
Telephone Number:	713-336-5374
Fax Number:	
Email Address:	Phyllis.Rodriguez@lyondellbasell.com
D. Assigned Numbers	
<p>The CN and RN below are assigned when a Core Data Form is initially submitted to the Central Registry. The RN is also assigned if the agency has conducted an investigation or if the agency has issued an enforcement action. If these numbers have not yet been assigned, leave these questions blank and include a Core Data Form with your application submittal. See Section VI.B. below for additional information.</p>	
Enter the CN. The CN is a unique number given to each business, governmental body, association, individual, or other entity that owns, operates, is responsible for, or is affiliated with a regulated entity.	CN600124705

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

Date: _____
Permit #: _____
Company: _____

Enter the RN. The RN is a unique agency assigned number given to each person, organization, place, or thing that is of environmental interest to us and where regulated activities will occur. The RN replaces existing air account numbers. The RN for portable units is assigned to the unit itself, and that same RN should be used when applying for authorization at a different location.	RN100210319
---	-------------

II. Delinquent Fees and Penalties

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

III. Permit Information

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

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

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

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

Permit Type	Action Type Requested (do not leave blank)	Permit Number (if assigned)
Minor NSR (can be a Title V major source): <i>Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Relocation/Alteration, Change of Location, Alteration, Extension to Start of Construction</i>	Amendment	114809
Special Permit: <i>Not applicable, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction</i>	Not applicable	
De Minimis: <i>Not applicable, Initial</i>	Not applicable	
Flexible: <i>Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction</i>	Not applicable	
PSD: <i>Not applicable, Initial, Major Modification</i>	Initial	
Nonattainment: <i>Not applicable, Initial, Major Modification</i>	Major Modification	N190
HAP Major Source [FCAA § 112(g)]: <i>Not applicable, Initial, Major Modification</i>	Not applicable	
PAL: <i>Not applicable, Initial, Amendment, Renewal, Renewal/Amendment, Alteration</i>	Not applicable	
GHG PSD: <i>Not applicable, Initial, Major Modification, Voluntary Update</i>	Not applicable	

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

Date: _____
 Permit #: _____
 Company: _____

--	--

B. MSS Activities	
How are/will MSS activities for sources associated with this project be authorized?	Combination (list below)
List the permit number, registration number, and/or PBR number.	114809, 106.263

C. Consolidating NSR Permits	
Will this permit be consolidated into another NSR permit with this action?	No
Will NSR permits be consolidated into this permit with this action?	
	No

D. Incorporation of Standard Permits, Standard Exemptions, and/or Permits By Rule (PBR)	
To ensure protectiveness, previously issued authorizations (standard permits, standard exemptions, or PBRs) including those for MSS, are incorporated into a permit either by consolidation or by reference. At the time of renewal and/or amendment, consolidation (in some cases) may be voluntary and referencing is mandatory. More guidance regarding incorporation can be found in 30 TAC § 116.116(d)(2), 30 TAC § 116.615(3) and in this memo:	
https://www.tceq.texas.gov/assets/public/permitting/air/memos/pbr_spc06.pdf	
Are there any standard permits, standard exemptions, or PBRs to be incorporated by reference?	No
Are there any PBR, standard exemptions, or standard permits associated to be incorporated by consolidation? Note: Emission calculations, a BACT analysis, and an impacts analysis must be attached to this application at the time of submittal for any authorization to be incorporated by consolidation.	No

E. Associated Federal Operating Permits	
Is this facility located at a site required to obtain a site operating permit (SOP) or general operating permit (GOP) ?	Yes
Is a SOP or GOP review pending for this source, area, or site?	Yes

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

Date: _____
 Permit #: _____
 Company: _____

If required to obtain a SOP or GOP , list all associated permit number(s). If no associated permit number has been assigned yet, enter "TBD":	O1606
---	-------

IV. Facility Location and General Information

A. Location

County: Enter the county where the facility is physically located.	Harris
--	--------

TCEQ Region	Region 12
-------------	-----------

County attainment status as of Sept. 23, 2019	Serious Ozone nonattainment
---	-----------------------------

Street Address:	1515 Miller Cut-Off Road
-----------------	--------------------------

City: If the address is not located in a city, then enter the city or town closest to the facility, even if it is not in the same county as the facility.	La Porte
---	----------

ZIP Code: Include the ZIP Code of the physical facility site, not the ZIP Code of the applicant's mailing address.	77571
--	-------

Site Location Description: If there is no street address, provide written driving directions to the site. Identify the location by distance and direction from well-known landmarks such as major highway intersections.	
--	--

Use USGS maps, county maps prepared by the Texas Department of Transportation, or an online software application such as Google Earth to find the latitude and longitude.

Latitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Latitude is the angular distance of a location north of the equator and will always be between 25 and 37 degrees north (N) in Texas.	29° 43' 03"
--	-------------

Longitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Longitude is the angular distance of a location west of the prime meridian and will always be between 93 and 107 degrees west (W) in Texas.	95° 04' 05"
--	-------------

Is this a project for a lead smelter, concrete crushing facility, and/or a hazardous waste management facility?	No
---	----

B. General Information

Site Name:	La Porte Complex
------------	------------------

Area Name: Must indicate the general type of operation, process, equipment or facility. Include numerical designations, if appropriate. Examples are Sulfuric Acid Plant and No. 5 Steam Boiler. Vague names such as Chemical Plant are not acceptable.	LB-1 Polyethylene Unit
---	------------------------

Are there any schools located within 3,000 feet of the site boundary?	No
---	----

C. Portable Facility

Permanent or portable facility?	Permanent
---------------------------------	-----------

--	--

D. Industry Type

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

Date: _____
 Permit #: _____
 Company: _____

Principal Company Product/Business:	Chemical Manufacturing
A list of SIC codes can be found at: https://www.naics.com/sic-codes-industry-drilldown/	
Principal SIC code:	2821
NAICS codes and conversions between NAICS and SIC Codes are available at: https://www.census.gov/eos/www/naics/	
Principal NAICS code:	325199
E. State Senator and Representative for this site	
This information can be found at (note, the website is not compatible to Internet Explorer): https://wrm.capitol.texas.gov/	
State Senator:	Larry Taylor
District:	11
State Representative:	Mary Ann Perez
District:	144

V. Project Information	
A. Description	
Provide a brief description of the project that is requested. (Limited to 500 characters).	Since the issuance of the permit on February 19, 2016, design changes have occurred which will affect air emissions. This amendment seeks to increase emissions from the flare (EPN LBFLARE) and revise several special conditions in the current permit.
B. Project Timing	
Authorization must be obtained for many projects before beginning construction. Construction is broadly interpreted as anything other than site clearance or site preparation. Enter the date as "Month Date, Year" (e.g. July 4, 1776).	
Projected Start of Construction:	N/A
Projected Start of Operation:	N/A
C. Enforcement Projects	
Is this application in response to, or related to, an agency investigation, notice of violation, or enforcement action?	No
D. Operating Schedule	
Will sources in this project be authorized to operate 8760 hours per year?	Yes

VI. Application Materials	
All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. (30 TAC § 116.116)	
A. Confidential Application Materials	
Is confidential information submitted with this application?	Yes
<i>If yes, is each confidential page marked "CONFIDENTIAL" in large red letters?</i>	Yes
THSC §382.041 requires us not to disclose any information related to manufacturing processes that is marked Confidential. Mark any information related to secret or proprietary processes or methods of manufacture Confidential if you do not want this information in the public file. All confidential information should be separated from the application and submitted as a separate file. Additional information regarding confidential information can be found at: https://www.tceq.texas.gov/permitting/air/confidential.html	
B. Is the Core Data Form (Form 10400) attached?	No
https://www.tceq.texas.gov/assets/public/permitting/centralregistry/10400.docx	

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

Date: _____
 Permit #: _____
 Company: _____

C. Is a current area map attached?	Yes
Is the area map a current map with a true north arrow, an accurate scale, the entire plant property, the location of the property relative to prominent geographical features including, but not limited to, highways, roads, streams, and significant landmarks such as buildings, residences, schools, parks, hospitals, day care centers, and churches?	Yes
Does the map show a 3,000-foot radius from the property boundary?	Yes
D. Is a plot plan attached?	Yes
Does your plot plan clearly show a north arrow, an accurate scale, all property lines, all emission points, buildings, tanks, process vessels, other process equipment, and two bench mark locations?	Yes
Does your plot plan identify all emission points on the affected property, including all emission points authorized by other air authorizations, construction permits, PBRs, special permits, and standard permits?	Yes
Did you include a table of emission points indicating the authorization type and authorization identifier, such as a permit number, registration number, or rule citation under which each emission point is currently authorized?	Yes
E. Is a process flow diagram attached?	Yes
Is the process flow diagram sufficiently descriptive so the permit reviewer can determine the raw materials to be used in the process; all major processing steps and major equipment items; individual emission points associated with each process step; the location and identification of all emission abatement devices; and the location and identification of all waste streams (including wastewater streams that may have associated air emissions)?	Yes
F. Is a process description attached?	Yes
Does the process description emphasize where the emissions are generated, why the emissions must be generated, what air pollution controls are used (including process design features that minimize emissions), and where the emissions enter the atmosphere?	Yes
Does the process description also explain how the facility or facilities will be operating when the maximum possible emissions are produced?	Yes
G. Are detailed calculations attached? Calculations must be provided for each source with new or changing emission rates. For example, a new source, changing emission factors, decreasing emissions, consolidated sources, etc. You do not need to submit calculations for sources which are not changing emission rates with this project. Please note: the preferred format is an electronic workbook (such as Excel) with all formulas viewable for review. It can be emailed with the submittal of this application workbook.	Yes
Are emission rates and associated calculations for planned MSS facilities and related activities attached?	Yes
H. Is a material balance (Table 2, Form 10155) attached?	Yes
Table 2 (Form 10155), entitled Material Balance: A material balance representation may be required for all applications to confirm technical emissions information. Typically this is required for refining and chemical manufacturing processes involving reactions, separations, and blending. It may also be requested by the permit reviewer for other applications. Table 2 should represent the total material balance; that is, all streams into the system and all streams out. Additional sheets may be attached if necessary. Complex material balances may be presented on spreadsheets or indicated using process flow diagrams. All materials in the process should be addressed whether or not they directly result in the emission of an air contaminant. All production rates must be based on maximum operating conditions.	
I. Is a list of MSS activities attached?	Yes
Are the MSS activities listed and discussed separately, each complete with the authorization mechanism or emission rates, frequency, duration, and supporting information if authorized by this permit?	Yes
J. Is a discussion of state regulatory requirements attached, addressing 30 TAC Chapters 101, 111, 112, 113, 115, and 117?	Yes
For all applicable chapters, does the discussion include how the facility will comply with the requirements of the chapter?	Yes
For all not applicable chapters, does the discussion include why the chapter is not applicable?	Yes
K. Are all other required tables, calculations, and descriptions attached?	Yes

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

Date: _____
Permit #: _____
Company: _____

VII. Signature

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

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

Name:	
Signature:	
<i>Original signature is required.</i>	
Date:	

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

Date: _____
Permit #: _____
Company: _____

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

Date: _____
 Permit #: _____
 Company: _____

V. Nonattainment Permits

Complete the offsets section of the Federal Applicability sheet of this workbook.	Yes
Does the application contain a detailed LAER analysis? (attachment or as notes on the BACT sheet of this workbook)	Yes
Does the application contain an analysis of alternative sites, sizes, production processes, and control techniques for the proposed source? The analysis must demonstrate that the benefits of the proposed location and source configuration significantly outweigh the environmental and social costs of that location.	Yes

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

Date: _____
 Permit #: _____
 Company: _____

VIII. Federal Regulatory Questions

Indicate if any of the following requirements apply to the proposed facility. Note that some federal regulations apply to minor sources. Enter all applicable Subparts.

A. Title 40 CFR Part 60	
Do NSPS subpart(s) apply to a facility in this application?	Yes
List applicable subparts you will demonstrate compliance with (e.g. Subpart M)	Subpart A, Vva, and DDD
B. Title 40 CFR Part 61	
Do NESHAP subpart(s) apply to a facility in this application?	No

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

Date: _____
 Permit #: _____
 Company: _____

C. Title 40 CFR Part 63	
Do MACT subpart(s) apply to a facility in this application?	No

IX. Emissions Review

A. Impacts Analysis

Any change that results in an increase in off-property concentrations of air contaminants requires an air quality impacts demonstration. Information regarding the air quality impacts demonstration must be provided with the application and show compliance with all state and federal requirements. Detailed requirements for the information necessary to make the demonstration are listed on the Impacts sheet of this workbook.

Does this project require an impacts analysis?	Yes
--	-----

B. Disaster Review

If the proposed facility will handle sufficient quantities of certain chemicals which, if released accidentally, would cause off-property impacts that could be immediately dangerous to life and health, a disaster review analysis may be required as part of the application. Contact the appropriate NSR permitting section for assistance at (512) 239-1250. Additional Guidance can be found at:

<https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/disrev-factsheet.pdf>

Does this application involve any air contaminants for which a disaster review is required?	No
---	----

--	--

C. Air Pollutant Watch List

Certain areas of the state have concentrations of specific pollutants that are of concern. The TCEQ has designated these portions of the state as watch list areas. Location of a facility in a watch list area could result in additional restrictions on emissions of the affected air pollutant(s) or additional permit requirements. The location of the areas and pollutants of interest can be found at:

<https://www.tceq.texas.gov/toxicology/apwl/apwl.html>

Is the proposed facility located in a watch list area?	No
--	----

--	--

D. Mass Emissions Cap and Trade

Is this facility located at a site within the Houston/Galveston nonattainment area (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties)?	Yes
--	-----

Is Mass Emissions Cap and Trade applicable to the new or modified facilities?	No
---	----

--	--

**Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates**

Date: _____
Permit #: _____
Company: _____

Permit primary industry (must be selected for workbook to function)	Chemical / Energy
---	-------------------

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)
Not New/Modified	Yes	LBCT	LBCT	LB-1 Cooling Tower	PM	0.4	1.55			0.4	1.55	0	0	Cooling Tower
					PM10	0.25	0.98			0.25	0.98	0	0	
					PM2.5	<0.01	<0.01			<0.01	<0.01	0	0	
Not New/Modified	Yes	LBFUG	LBFUG	LB-1 Process Fugitives	VOC	2.26	9.9			2.26	9.9	0	0	Fugitives: Piping and Equipment Leak
Not New/Modified	Yes	LBRVE	LBRVE	Residual VOC Emissions	VOC	9.24	20.25			9.24	20.25	0	0	Polyethylene Facilities
New/Modified	Yes	LBFLARE	LBFLARE	LB-1 Flare	CO	303.38	42.59			313.37	85.63	9.9901	43.04	Control: Flare
					NOx	65.53	8.68			67.47	17.03	1.94	8.35	
					SO2	0.43	1.86			2.55	2.58	2.12	0.72	
					VOC	447.21	39.55			447.21	38.22	0	-1.33	
New/Modified	Yes	MSSLBFLARE	MSSLBFLARE	MSS Flaring	CO	368.17	6.55			374.72	38.67	6.5501	32.12	Control: Flare
					NOx	73.74	1.31			75.02	7.57	1.28	6.26	
					VOC	481.76	8.7			489.48	15.34	7.7201	6.64	
					SO2					2.07	1.23	2.07	1.23	
Not New/Modified	Yes	LBWW	LBWW	LB-1 Wastewater Flow	VOC	0.52	0.38			0.52	0.38	0	0	Wastewater Facilities
Not New/Modified	Yes	LBANALYZ	LBANALYZ	LB-1 Analyzers	VOC	0.02	0.01			0.02	0.01	0	0	Process Vent
Not New/Modified	Yes	MSS-LB1RM	MSS-LB1RM	LB-1 Routine Maintenance	VOC	2.63	<0.01			2.63	<0.01	0	0	MSS Activities
Not New/Modified	Yes	MSS-LB1RMA	MSS-LB1RMA	LB1 MSS - Attachment A	VOC	1.25	0.01			1.25	0.01	0	0	MSS Activities
					Tetrachloroethylene	1.26	0.04			1.26	0.04	0	0	
Not New/Modified	Yes	MSS-LB1-VC	MSS-LB1-VC	LB-1 Vessel Clearing	VOC	48.68	0.35			48.68	0.35	0	0	MSS Activities
Not New/Modified	Yes	LBV603	LBV603	Alkyls Seal Oil Pot Vent	VOC	<0.01	<0.01			<0.01	<0.01	0	0	Process Vent
Not New/Modified	Yes	LBD108	LBD108	Mineral Oil Storage Drum	VOC	0.01	0.01			0.01	0.01	0	0	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia
Not New/Modified	Yes	LBF806	LBF806	Additive Feed Vent System	PM	0.07	0.3			0.07	0.3	0	0	Control: Bag Filter/Baghouse
					PM10	0.07	0.3			0.07	0.3	0	0	
					PM2.5	0.07	0.3			0.07	0.3	0	0	
Not New/Modified	Yes	LBF807	LBF807	Housekeeping Clean-up Vacuum System	PM	0.08	0.06			0.08	0.06	0	0	Control: Bag Filter/Baghouse
					PM10	0.08	0.06			0.08	0.06	0	0	
					PM2.5	0.08	0.06			0.08	0.06	0	0	
Not New/Modified	Yes	LBF816	LBF816	Bulk Additive Silo Filter (Talc)	PM	0.1	0.02			0.1	0.02	0	0	Control: Bag Filter/Baghouse
					PM10	0.1	0.02			0.1	0.02	0	0	
					PM2.5	0.1	0.02			0.1	0.02	0	0	
Not New/Modified	Yes	LBOHG	LBOHG	LB-1 Oil Hydraulic Guard D114	VOC	<0.01	<0.01			<0.01	<0.01	0	0	Process Vent
Not New/Modified	Yes	LBD817	LBD817	TNPP Additive Drum Vent	VOC	<0.01	<0.01			<0.01	<0.01	0	0	Process Vent
Not New/Modified	Yes	LB30F965	LB30F965	30-F-965 Filter	PM	0.4	1.63			0.4	1.63	0	0	Control: Bag Filter/Baghouse
					PM10	0.4	1.63			0.4	1.63	0	0	
					PM2.5	0.1	0.41			0.1	0.41	0	0	
Not New/Modified	Yes	LB30F900A	LB30F900A	30-F-900A Elutriator Vent	PM	0.14	0.46			0.14	0.46	0	0	Control: Bag Filter/Baghouse
					PM10	0.14	0.46			0.14	0.46	0	0	
					PM2.5	0.04	0.11			0.04	0.11	0	0	
Not New/Modified	Yes	LB30F900B	LB30F900B	30-F-900B Elutriator Vent	PM	0.14	0.46			0.14	0.46	0	0	Control: Bag Filter/Baghouse
					PM10	0.14	0.46			0.14	0.46	0	0	
					PM2.5	0.04	0.11			0.04	0.11	0	0	
Not New/Modified	Yes	LBBL980	LBBL980	Hopper Blower	PM	0.14	0.01			0.14	0.01	0	0	Control: Bag Filter/Baghouse
					PM10	0.14	0.01			0.14	0.01	0	0	
					PM2.5	0.03	<0.01			0.03	<0.01	0	0	
Not New/Modified	Yes	LBPk810	LBPk810	Pellet Dryer Vent	PM	0.17	0.75			0.17	0.75	0	0	Process Vent
					PM10	0.17	0.75			0.17	0.75	0	0	
					PM2.5	0.17	0.75			0.17	0.75	0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	

**Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates**

Date: _____
Permit #: _____
Company: _____

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	

**Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates**

Date: _____
 Permit #: _____
 Company: _____

Facility ID Number (FIN)	Unit Type Notes (only if "other" unit type in Column O)

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

Date: _____
 Permit #: _____
 Company: _____

Emission Point Discharge Parameters												
EPN	Included in EMEW?	UTM Coordinates		Building Height (ft)	Height Above Ground (ft)	Stack Exit Diameter (ft)	Velocity (FPS)	Temperature (°F)	Fugitives - Length (ft)	Fugitives - Width (ft)	Fugitives - Axis Degrees	
		Zone	East (Meters)									North (Meters)
LBCT	Yes											
LBFUG	Yes											
LBRVE	Yes											
LBFLARE	Yes											
MSSLBFLARE	Yes											
LBWW	Yes											
LBANALYZ	Yes											
MSS-LB1RM	Yes											
MSS-LB1RMA	Yes											
MSS-LB1-VC	Yes											
LBV603	No	15	299825	3288750	10	0.16666667	10	86				
LBD108	No	15	299825	3288700	20	0.16666667	1	104				
LBF806	Yes											
LBF807	Yes											
LBF816	Yes											
LBOHG	No	15	299850	3288700	20	0.16666667	1	122				
LBD817	No	15	299840	3288530	12	0.16666667	1	122				
LB30F965	Yes											
LB30F900A	Yes											
LB30F900B	Yes											
LBBL980	Yes											
LBPK810	Yes											

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

Date: _____
 Permit #: _____
 Company: _____

I. Public Notice Applicability

A. Application Type

Is this an application for a new or major modification of a PSD (including GHG), Nonattainment, or HAP permit?	Yes
Is this an application for a minor permit amendment?	Yes
Is there any change in character of emissions in this application (a new criteria pollutant or a new VOC or PM species)?	No
Is there a new air contaminant in this application?	No

B. Project Increases and Public Notice Thresholds (for Initial and Amendment Projects)

For public notice applicability, the agency does not include consolidation or incorporation of any previously authorized facility or activity (PBR, standard permits, etc.), changes to permitted allowable emission rates when exclusively due to changes to standardized emission factors, or reductions in emissions which are not enforceable through the amended permit. Thus, the total emissions increase would be the sum of emissions increases under the amended permit and the emissions decreases under the amended permit for each air contaminant.

The table below will generate emission increases based on the values represented on the "Unit Types - Emission Rates" sheet. Use the "yes" and "no" options in column B of the "Unit Types - Emission Rates" worksheet to indicate if a unit's proposed change of emissions should be included in these totals.

Notes:

1. Emissions of PM, PM10, and/or PM2.5 may have been previously quantified and authorized as PM, PM10, and/or PM2.5. These emissions will be speciated based on current guidance and policy to demonstrate compliance with current standards and public notice requirements may change during the permit review.

2. All renewals require public notice.

This row is optional. If you do not think the table below accurately represents public notice applicability increases for your project, provide discussion here (1000 characters).	
--	--

Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetable fibers (agricultural facilities)?	No
---	----

**Texas Commission on Environmental Quality
Form PI-1 General Application
Public Notice**

Date: _____
Permit #: _____
Company: _____

Pollutant	Current Long-Term (tpy)	Consolidated Emissions (tpy)	Proposed Long-Term (tpy)	Project Change in Allowable (tpy)	PN Threshold	Notice required?
VOC	79.20	0.00	84.51	5.31	5	Yes
PM	5.24	0.00	5.24	0.00	5	No
PM ₁₀	4.67	0.00	4.67	0.00	5	No
PM _{2.5}	1.78	0.00	1.78	0.00	5	No
NO _x	9.99	0.00	24.60	14.61	5	Yes
CO	49.14	0.00	124.30	75.16	50	Yes
SO ₂	1.86	0.00	3.81	1.95	10	No
Pb	0.00	0.00	0.00	0.00	0.6	No
Tetrachloroethylene	0.04	0	0.04	0	5	No

* Notice is required for PM, PM10, and PM2.5 if one of these pollutants is above the threshold.

** Notice of a GHG action is determined by action type. Initial and major modification always require notice. Voluntary updates require a consolidated notice if there is a change to BACT. Project emission increases of CO2e (CO2 equivalent) are not relevant for determining public notice of GHG permit actions.

C. Is public notice required for this project as represented in this workbook?
If no, proceed to Section III Small Business Classification.
Note: public notice applicability for this project may change throughout the technical review.

Yes

D. Are any HAPs to be authorized/re-authorized with this project? The category "HAPs" must be specifically listed in the public notice if the project authorizes (reauthorizes for renewals) any HAP pollutants.

Yes

II. Public Notice Information

Complete this section if public notice is required (determined in the above section) or if you are not sure if public notice is required.

A. Contact Information

Enter the contact information for the **person responsible for publishing**. This is a designated representative who is responsible for ensuring public notice is properly published in the appropriate newspaper and signs are posted at the facility site. This person will be contacted directly when the TCEQ is ready to authorize public notice for the application.

Prefix (Mr., Ms., Dr., etc.):	Ms.
First Name:	Phyllis
Last Name:	Rodriguez
Title:	Environmental Department
Company Name:	Equistar Chemicals, LP
Mailing Address:	PO Drawer D
Address Line 2:	

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

Date: _____
 Permit #: _____
 Company: _____

City:	Deer Park
State:	TX
ZIP Code:	77536-1900
Telephone Number:	713-336-5374
Fax Number:	
Email Address:	Phyllis.Rodriguez@lyondellbasell.com

Enter the contact information for the **Technical Contact**. This is the designated representative who will be listed in the public notice as a contact for additional information.

Prefix (Mr., Ms., Dr., etc.):	Ms.
First Name:	Phyllis
Last Name:	Rodriguez
Title:	Environmental Department
Company Name:	Equistar Chemicals, LP
Mailing Address:	PO Drawer D
Address Line 2:	
City:	Deer Park
State:	TX
ZIP Code:	77536-1900
Telephone Number:	713-336-5374
Fax Number:	
Email Address:	Phyllis.Rodriguez@lyondellbasell.com

B. Public place

Place a copy of the full application (including all of this workbook and all attachments) at a public place in the county where the facilities are or will be located. You must state where in the county the application will be available for public review and comment. The location must be a public place and described in the notice. A public place is a location which is owned and operated by public funds (such as libraries, county courthouses, city halls) and cannot be a commercial enterprise. You are required to pre-arrange this availability with the public place indicated below. The application must remain available from the first day of publication through the designated comment period.

If this is an application for a PSD, nonattainment, or FCAA §112(g) permit, the public place must have internet access available for the public as required in 30 TAC § 39.411(f)(3).

If the application is submitted to the agency with information marked as Confidential, you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: ***Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the TCEQ Public Information Coordinator, MC 197, P.O. Box 13087, Austin, Texas 78711-3087.***

Name of Public Place:	La Porte Branch Library
Physical Address:	600 S. Broadway
Address Line 2:	
City:	La Porte
ZIP Code:	77571
County:	Harris
Has the public place granted authorization to place the application for public viewing and copying?	Yes
Does the public place have Internet access available for the public?	Yes

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

Date: _____
 Permit #: _____
 Company: _____

C. Alternate Language Publication

In some cases, public notice in an alternate language is required. If an elementary or middle school nearest to the facility is in a school district required by the Texas Education Code to have a bilingual program, a bilingual notice will be required. If there is no bilingual program required in the school nearest the facility, but children who would normally attend those schools are eligible to attend bilingual programs elsewhere in the school district, the bilingual notice will also be required. If it is determined that alternate language notice is required, you are responsible for ensuring that the publication in the alternate language is complete and accurate in that language.

Is a bilingual program required by the Texas Education Code in the School District?	Yes
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
If yes to either question above, list which language(s) are required by the bilingual program?	Spanish

D. PSD and Nonattainment Permits Only

If this is an application for emissions of GHGs, select either "Separate Public Notice" or "Consolidated Public Notice". Note: Separate public notices requires a separate application.	Not applicable
---	----------------

We must notify the applicable county judge and presiding officer when a PSD or Nonattainment permit or modification application is received. This information can be obtained at:

<https://www.txdirectory.com>

Provide the information for the **County Judge** for the location where the facility is or will be located.

The Honorable:	Lina Hidalgo
Mailing Address:	1001 Preston, Suite 911
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77002

Provide the information for the **Presiding Officer(s)** of the municipality for this facility site. This is frequently the Mayor.

First Name:	Louis
Last Name:	Rigby
Title:	Mayor
Mailing Address:	604 W Fairmont Parkway
Address Line 2:	
City:	La Porte
State:	TX
ZIP Code:	77571

Are the proposed facilities located within 100 km or less of an affected state or Class I Area?	No
---	----

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

Date: _____
 Permit #: _____
 Company: _____

III. Small Business Classification

Complete this section to determine small business classification. If a small business requests a permit, agency rules (30 TAC § 39.603(f)(1)(A)) allow for alternative public notification requirements if all of the following criteria are met. If these requirements are met, public notice does not have to include publication of the prominent (12 square inch) newspaper notice.

Does the company (including parent companies and subsidiary companies) have fewer than 100 employees or less than \$6 million in annual gross receipts?	No
Small business classification:	No

**Texas Commission on Environmental Quality
Form PI-1 General Application
Federal Applicability**

Date: _____
Permit #: _____
Company: _____

I. County Classification	
Does the project require retrospective review?	Yes
If so, what is the issuance date of the project being revisited? (xx/xx/xx)	2/9/2016
If so, select the nonattainment classification of the county when the project being revisited was authorized.	ozone severe
The workbook includes one retrospective review. If the project includes multiple, provide an attachment listing the additional issuance dates, classifications at the time of authorization, and offset data for each additional retrospective review in the project.	
County (completed for you from your response on the General sheet)	Harris

II. PSD and GHG PSD Applicability Summary			
Is netting required for the PSD analysis for this project?			Yes
If yes, the project increases listed below should be after netting has been performed. Attach the netting information to the application.			
Pollutant	Project Increase (after netting)	Threshold	PSD Review Required?
CO	190.52	100	Yes
NO _x			
PM			
PM ₁₀			
PM _{2.5}			
SO ₂			
Pb			
H ₂ S			
TRS			
Reduced sulfur compounds (including H ₂ S)			
H ₂ SO ₄			
Fluoride (excluding HF)			
CO _{2e}			

III. Nonattainment Applicability Summary			
Is netting required for the nonattainment analysis for this project?			Yes
If yes, the project increases listed below should be after netting has been performed. Attach the netting information to the application.			
Pollutant	Project Increase (after netting)	Threshold	NA Review Required?
Ozone (as VOC)	84.74	25	Yes

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

Date: _____
 Permit #: _____
 Company: _____

Ozone (as NO _x)	58.69	25	Yes
-----------------------------	-------	----	-----

V. Offset Summary (for Nonattainment Permits doing Retrospective Review)

Pollutant	Offset Ratio	Offset Quantity Required (tpy)	Where is the offset coming from?
Ozone (as VOC)	1.30 : 1	110.162	
Ozone (as NO _x)	1.30 : 1	76.297	Offsetting project increase of 24.7 tpy (32.11 tpy)

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

Date: _____
 Permit #: _____
 Company: _____

I. General Information - Non-Renewal	
Is this project for new facilities controlled and operated directly by the federal government? (30 TAC § 116.141(b)(1) and 30 TAC § 116.163(a))	No
A fee of \$75,000 shall be required if no estimate of capital project cost is included with the permit application. (30 TAC § 116.141(d)) Select "yes" here to use this option. Then skip sections II and III.	No
Select Application Type	Major Application

II. Direct Costs - Non-Renewal	
Type of Cost	Amount
Process and control equipment not previously owned by the applicant and not currently authorized under this chapter.	\$0.00
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.	\$0.00
Freight charges.	\$0.00
Site preparation, including demolition, construction of fences, outdoor lighting, road, and parking areas.	\$0.00
Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment.	\$0.00
Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures.	\$0.00
Ambient air monitoring network.	\$0.00
Sub-Total:	\$0.00

III. Indirect Costs - Non-Renewal	
Type of Cost	Amount
Final engineering design and supervision, and administrative overhead.	\$0.00
Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up.	\$0.00
Contractor's fee and overhead.	\$0.00
Sub-Total:	\$0.00

IV. Calculations - Non-Renewal
For GHG permits: A single PSD fee (calculated on the capital cost of the project per 30 TAC § 116.163) will be required for all of the associated permitting actions for a GHG PSD project. Other NSR permit fees related to the project that have already been remitted to the TCEQ can be subtracted when determining the appropriate fee to submit with the GHG PSD application. Identify these other fees in the GHG PSD permit application.

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

Date: _____
Permit #: _____
Company: _____

In signing the "General" sheet with this fee worksheet attached, 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.

Estimated Capital Cost	Major Application Fee
Less than \$300,000	\$3,000 (minimum fee)
\$300,000 - \$7,500,000	1.0% of capital cost
\$300,000 - \$25,000,000	N/A
Greater than \$7,500,000	\$75,000 (maximum fee)
Greater than \$25,000,000	N/A

Your estimated capital cost:	\$0.00	Minimum fee applies.
Permit Application Fee:	\$3,000.00	

--	--

VI. Total Fees	
Note: fees can be paid together with one payment or as two separate payments.	
Non-Renewal Fee	\$3,000.00
Total	\$3,000.00

VII. Payment Information	
A. Payment One (required)	
Was the fee paid online?	
Enter the fee amount:	
Enter the check, money order, ePay Voucher, or other transaction number:	
Enter the Company name as it appears on the check:	
C. Total Paid	\$0.00

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

Date: _____
Permit #: _____
Company: _____

VIII. Professional Engineer Seal Requirement	
Is the estimated capital cost of the project above \$2 million?	No
Is the application required to be submitted under the seal of a Texas licensed P.E.? Note: an electronic PE seal is acceptable.	No

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

Date: _____
 Permit #: _____
 Company: _____

Pollutant	Does this pollutant require PSD review?	How will you demonstrate that this project meets all applicable requirements?	Notes	Additional Notes (optional)
Ozone	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
VOC	No	MERA steps 0-2 AND Modeling (screen or refined)	Attach both an "Electronic Modeling Evaluation Workbook" (EMEW) AND a detailed description of which MERA step was met. Include speciated emission rates with the total VOC and/or PM species corresponding to the short-term and long-term differences represented on the Unit Types-Emission Rates sheet.	
PM	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
PM10	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
PM2.5	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
CO	Yes	Protocol (required for all PSD projects, excluding GHG PSD)	Attach a protocol meeting all requirements listed on the TCEQ website.	
NOx	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
SO2	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
Tetrachloroethylene	No	MERA steps 0-2 AND Modeling (screen or refined)	Attach both an "Electronic Modeling Evaluation Workbook" (EMEW) AND a detailed description of which MERA step was met. Include speciated emission rates with the total VOC and/or PM species corresponding to the short-term and long-term differences represented on the Unit Types-Emission Rates sheet.	

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

Date: _____
Permit #: _____
Company: _____

Pollutant	Does this pollutant require PSD review?	How will you demonstrate that this project meets all applicable requirements?	Notes	Additional Notes (optional)

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

Date: _____
Permit #: _____
Company: _____

Monitoring

This sheet provides the minimum acceptable requirements to demonstrate compliance through monitoring for each pollutant proposed to be emitted from each FIN. This sheet also includes measuring techniques for sources of significant emissions in the project.

- Instructions:**
- The unit types listed under Unit Type (column B) include all new, modified, consolidated, and/or renewed sources as indicated on the "Unit Types - Emission Rates" sheet. Each new, modified, consolidated, and/or renewed source must address how compliance will be demonstrated.
 - The pollutants listed in Pollutant (column C) include the pollutants indicated on the "Unit Types - Emission Rates" sheet.

Monitoring (30 TAC § 116.111(a)(2)(G))

- The minimum acceptable monitoring is automatically populated for each unit type and pollutant.
 - Additional monitoring may be required, particularly for Title V sources, and will be included in the NSR and/or Title V permits.
- Fully expand the Minimum Monitoring Requirements (column D) by increasing the row heights so all text is visible. (Place the cursor on the bottom of the number line to the far left of the screen, click and drag downward until all text is visible.)
- Review the monitoring and confirm that you will meet all representations listed on the sheet and any additional attachments by entering or selecting "Yes" in Confirm (column E).
- Add additional notes as necessary in Additional Notes for Monitoring (column F), limited to 500 characters or fewer. Examples include the following:
 - Proposed monitoring for pollutants or units that list "See additional notes:";
 - Details requested in the populated data;
 - Alternative monitoring you are proposing; and
 - Any additional information relevant to the minimization of emissions.
- Cap EPNs do not need monitoring (leave those rows blank).

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

- Note: this section will be greyed out if this project does not require PSD or nonattainment review, as represented on the General sheet.
- For each pollutant with a project increase **greater** than the PSD significant emission rate, select the proposed measurement technique using the dropdown (column G).
 - For each pollutant with a project increase **less** than the PSD significant emission rate: leave blank.
 - If selecting "other", provide details in Additional Notes for Measuring (column H).

[Click here to return to Cover Sheet.](#)

Important Note: The permit holder shall maintain a copy of the permit along with records containing the information and data sufficient to demonstrate compliance with the permit, including production records and operating hours. All required records must be maintained in a file at the plant site. If, however, the facility normally operates unattended, records shall be maintained at the nearest staffed location within Texas specified in the application. The site must make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction in a timely manner. The applicant must comply with any additional recordkeeping requirements specified in special conditions in the permit. All records must be retained in the file for at least two years following the date that the information or data is obtained. Some permits are required to maintain records for five years. [30 TAC § 116.115(b)(2)(E)]

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring	Proposed Measurement Technique (only complete for pollutants with a project increase above the PSD threshold)	Additional Notes for Measuring:
LBFLARE	Control: Flare	CO	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes		Record keeping	
		NOx	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes			
		SO2	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes			
		VOC	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes			
MSSLBFLARE	Control: Flare	CO	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes		Record keeping	
		NOx	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes			
		VOC	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes			
		SO2	Pilot flame presence monitored continuously. Waste gas flow and composition monitored continuously (measured at the instrument's capability or every 15 minutes, which ever is less), with hourly averages recorded. A Btu analyzer may be substituted for the composition analyzer where the composition is understood.	Yes			

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

Date: _____
Permit #: _____
Company: _____

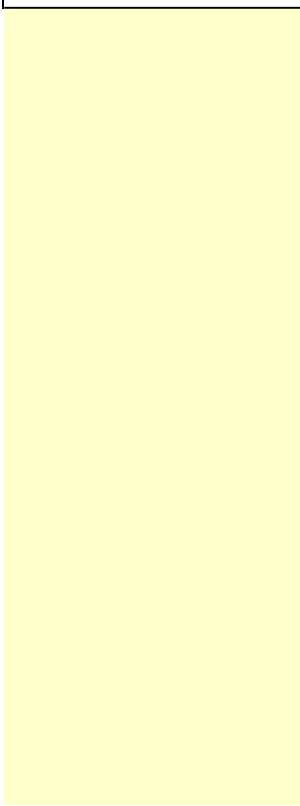
[Click to go to the next page.](#)

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

Date: _____
Permit #: _____
Company: _____

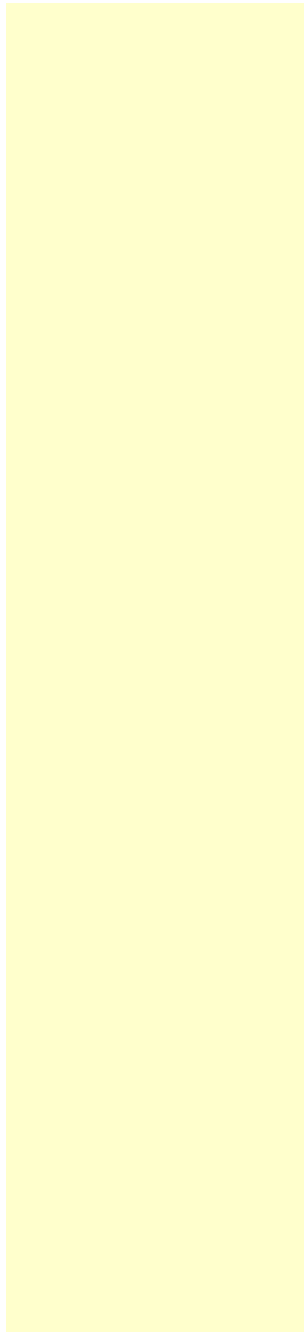
Applicant Internal Comments

All comments must be deleted prior to application
submittal.



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

Date: _____
Permit #: _____
Company: _____



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

Date: _____
Permit #: _____
Company: _____



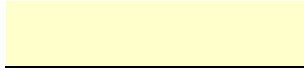
**Texas Commission on Environmental Quality
Form PI-1 General Application
Monitoring**

Date: _____
Permit #: _____
Company: _____



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

Date: _____
Permit #: _____
Company: _____





TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	5/10/2019	Permit No:	114809	Regulated Entity No:	RN100210319
Area Name:	LB-1 Polyethylene Unit	Customer Reference No:	CN600124705		

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) PPH	(B) TPY
LBCT	LBCT	LB-1 Cooling Tower	PM	0.40	1.55
			PM10	0.25	0.98
			PM2.5	<0.01	<0.01
LBFUG	LBFUG	LB-1 Process Fugitives	VOC	2.26	9.90
LBRVE	LBRVE	Residual VOC Emissions	VOC	9.24	20.25
LBFLARE	LBFLARE	LB-1 Flare	CO	307.58	43.21
			NOx	66.34	8.79
			SOx	0.43	0.12
LBFLARE	LBUNIT	LB-1 Flare	VOC	453.11	40.14
MSS-LBFLARE	MSS-LBFLARE	LB-1 MSS Flaring	CO	368.17	34.71
			NOx	73.74	6.84
			VOC	481.76	16.90
			SOx	0.42	0.21
LBWW	LBWW	LB-1 WasteWater Flow	VOC	0.52	0.38
LBANALYZ	LBANALYZ	LB-1 Analyzers	VOC	0.02	0.01
MSS-LB1RM	MSS-LB1RM	LB-1 Routine Maintenance	VOC	2.63	<0.01



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date:	5/10/2019	Permit No:	114809	Regulated Entity No:	RN100210319
Area Name:	LB-1 Polyethylene Unit	Customer Reference No:	CN600124705		

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) PPH	(B) TPY
MSS-LB1RMA	MSS-LB1RMA	LB1 MSS - Attachment A	VOC	1.25	0.01
			Tetrachloroethylene	1.26	0.04
MSS-LB1-VAC	MSS-LB1-VAC	LB-1 Vacuum Trucks	VOC	1.66	0.16
MSS-LB1-VC	MSS-LB1-VC	LB-1 Vessel Clearing	VOC	48.68	0.35
LBV603	LBV603	Alkyls Seal Oil Pot Vent	VOC	<0.01	<0.01
LBD108	LBD108	Mineral Oil Storage Drum	VOC	0.01	0.01
LBF806	LBF806	Additive Feed Vent System	PM	0.07	0.30
			PM10	0.07	0.30
			PM2.5	0.07	0.30
LBF807	LBF807	Housekeeping Clean-Up Vacuum System	PM	0.08	0.06
			PM10	0.08	0.06
			PM2.5	0.08	0.06
LBF816	LBF816	Bulk Additive Silo Filter (Talc)	PM	0.10	0.02
			PM10	0.10	0.02
			PM2.5	0.10	0.02
LBOHG	LBOHG	LB-1 Oil Hydraulic Guard D114	VOC	<0.01	<0.01
LBD817	LBD817	TNPP Additive Drum Vent	VOC	<0.01	<0.01

EPN = Emission Point Number
 FIN = Facility Identification Number



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 5/10/2019	Permit No: 114809	Regulated Entity No: RN100210319
Area Name: LB-1 Polyethylene Unit	Customer Reference No: CN600124705	

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) PPH	(B) TPY
LB30F965	LB30F965	30-F-965 Filter	PM	0.40	1.63
			PM10	0.40	1.63
			PM2.5	0.10	0.41
LB30F900A	LB30F900A	30-F-900A Elutriator Vent	PM	0.14	0.46
			PM10	0.14	0.46
			PM2.5	0.04	0.11
LB30F900B	LB30F900B	30-F-900B Elutriator Vent	PM	0.14	0.46
			PM10	0.14	0.46
			PM2.5	0.04	0.11
LBBL980	LBBL980	Hopper Blower	PM	0.14	0.02
			PM10	0.14	0.01
			PM2.5	0.03	<0.01
LBPK810	LBPK810	Pellet Dryer Vent	PM	0.17	0.75
			PM10	0.17	0.75
			PM2.5	0.17	0.75



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

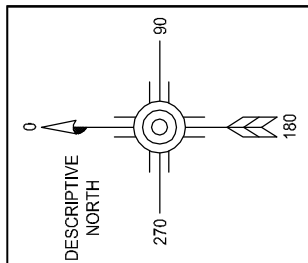
Table 1(a) Emission Point Summary

Date:	5/10/2019	Permit No:	114809	Regulated Entity No:	RN100210319
Area Name:	LB-1 Polyethylene Unit	Customer Reference No:	CN600124705		

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			4. UTM Coord			5. Building Height (Ft.)	Above Ground (Ft.)	7. STACK EXIT DATA			8. Fugitives		
(A) EPN	(B) FIN	(C) Name	ZONE	East (Meters)	North (Meters)			(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees
LBCT	LBCT	LB-1 Cooling Tower	15	299903	3288533		45				126	48	0
LBFUG	LBFUG	LB-1 Process Fugitives	15	299823	3288360		10				1000	500	0
LBRVE	LBRVE	Residual VOC Emissions	15	299780	3288205		20				1500	200	0
LBWW	LBWW	LB-1 WasteWater Flow	15	299895	3288380		300	1.16	400.0	1800			
LBANALYZ	LBANALYZ	LB-1 Analyzers	15	299828	3288608	8	10	0.06	1.0	100			
MSS-LB1RM	MSS-LB1RM	LB-1 Routine Maintenance	15	299823	3288360		10				2000	500	0
MSS-LB1RMA	MSS-LB1RMA	LB1 MSS - Attachment A	15	299823	3288360		10				2000	500	0
MSS-LB1-VC	MSS-LB1-VC	LB-1 Vessel Clearing	15	299823	3288360		20				2000	500	0
LBV603	LBV603	Alkyls Seal Oil Pot Vent	15	299825	3288750		10	0.17	10.0	86			
LBD108	LBD108	Mineral Oil Storage Drum	15	299825	3288700		20	0.17	1.0	104			
LBF806	LBF806	Additive Feed Vent System	15	299850	3288550		74 (1)	1.00	5.0	200			
LBF807	LBF807	Clean-Up Vacuum System	15	299850	3288550		8 (1)	1.00	5.0	200			
LBF816	LBF816	Bulk Additive Silo Filter (Talc)	15	299820	3288320		144 (1)	0.75	10.0	70		35	
LBOHG	LBOHG	LB-1 Oil Hydraulic Guard D114	15	299850	3288700		20	0.17	1.0	122			
LBD817	LBD817	TNPP Additive Drum Vent	15	299840	3288530		12	0.17	1.0	122			
LB30F965	LB30F965	30-F-965 Filter	15	299789	3288218		72 (1)	0.17	1.0	122			
LB30F900A	LB30F900A	30-F-900A Elutriator Vent	15	299801	3288218		18 (1)	0.17	1.0	122			
LB30F900B	LB30F900B	30-F-900B Elutriator Vent	15	299801	3288218		18 (1)	0.17	1.0	122			
LBBL980	LBBL980	Hopper Blower	15	299810	3288225		12 (1)	0.83	1.0	100			
LBPK810	LBPK810	Pellet Dryer Vent	15	299810	3288225		116.5 (1)	2.67	1.0	100			

3. AREA MAP



REFERENCE DRAWINGS	

NOTES	

NO.	DATE	DESCRIPTION	BY	APPR.
2	09/2013	ADDED LB-1	CC	GW
1	08/03/12	PER ENVIRON. DEPT. COMMENTS	CC	GW
0	9/30/2010	QE-1 AMENDMENT	CC	GW

REVISIONS

This drawing is the property of an affiliate of LyondellBasell Industries and may not be used, reproduced, published or disclosed to others without its written authorization. This drawing is provided to others only for the purpose of producing items on order for LyondellBasell Industries or its licensees. It is not to be used in any way detrimental to LyondellBasell Industries and is subject to return upon request.

EQUISTAR

Equistar Chemicals, LP and LyondellBasell Acetyls, LLC
 1515 Miller Cut-Off Road
 La Porte, TX 77571

P.O. Drawer D
 Deer Park, TX 77536

LA PORTE COMPLEX FIGURE 1-1 AREA MAP				DRAWING NO. D-00-D03-17000
DATE	09/2010	SCALE	1"=200'	
DRAWN BY	CC	CHECKED BY	.	
DEPT. APPR.	.	ENG. APPR.	.	
LOCATION	DRAWING NO.	ISSUE	.	
D-00-D03-17000		2		

4. PLOT PLAN

Plot Plan is included in Confidential Appendix E.

5. PROCESS DESCRIPTION

The LB-1 unit produces polymers and co-polymers of ethylene. The process is described below.

Raw Material Storage and Preparation

This area contains storage and feed equipment for various catalysts, cocatalysts, chemicals, and oils. These chemicals are typically low vapor pressure and are kept in enclosed, nitrogen-blanketed, vessels.

This section also includes loading and unloading operations for raw materials.

Feed Purification

Incoming ethylene, propane, and co-monomers, pass through pretreatment systems to remove impurities harmful to the process. The purification beds typically remove water and other impurities. Periodically, the purification beds must be regenerated by purging with nitrogen. These purge streams are sent to a flare for control.

Reaction

The purified feeds are fed to the reaction section. The powder is removed and is transferred to degassing. The unreacted gasses are extensively recycled.

Gas Recycle

Unreacted ethylene and other gasses are recovered and recycled in this area. The polyethylene product is degassed and the recovered gas is sent back to the reaction section. An offgas stream is sent to either the Olefins Unit as a feed (preferably) or as a back-up, to the boilers as a fuel. If neither the Olefins Unit nor the boilers can take this stream, it is sent to the flare.

Catalyst Deactivation

The polymer powder is stripped with nitrogen and steam to deactivate any residual catalyst and to remove residual hydrocarbons. The offgas stream from this area is routed to either the boilers (preferred) or the flare.

Cooling

Cooling in the process is accomplished by closed-loop circulation of purified water. The water is cooled by heat exchange with an evaporative cooling tower system. The cooling tower water is only used to cool the purified water and does not have any contact with exchangers in VOC service. The cooling tower will have particulate matter emissions from drift.

The purified water cooling system (jacket water) is designed to have zero emissions.

Powder Extrusion/Pelletizing

The polymer powder is fed to a mixer, melted and blended with additives, and then passed through an extruder where the polymer is converted to pellets. The pellets are dried, blended, and stored in silos prior to shipment via railcar or truck. The first place the polymer can contact the atmosphere directly is where the residual VOC's in the powder is monitored to account for any downstream VOC emissions from the polymer, (EPN: LBRVE). The

powder is designed to have an annual average of less than 40 ppmw residual VOC and an hourly maximum of 100 ppmv.

Flares

The continuous flare handles the relatively low volume day-to-day vapors to be controlled from both LB-1 and the Q1 units. The continuous also processes emissions from emergencies such as fire or loss of power.

Solids Handling

The polyethylene solids, powder and pellets, are moved through the process pneumatically. Before venting these streams, they are filtered to remove particulate matter to less than 1 grain/100 dry standard cubic feet.

This section also includes the loading and unloading of bulk containers.

Maintenance, Startup, and Shutdown, (MSS)

Individual process components, such as pumps, filters, valves, and heat exchangers, may require maintenance periodically. When this occurs, the selected equipment is typically purged with nitrogen, isolated, and after checking to make sure it is VOC < 10,000 ppmv opened to atmosphere. These are the “routine maintenance” emissions, (EPN: MSS-LB1RM).

When larger portions of the unit are shut down, they will be purged with nitrogen to the boilers or flare. The boiler emissions are authorized by Permit 5226. The flare emissions are EPN: LBFLARE. When the equipment is cleared to less than 10,000 ppmv VOC, it may be opened to atmosphere, (EPN: MSS-LB1-VC).

Utilities

The LB-1 unit will utilize various utility streams, such as potable water, service water, steam, nitrogen, and instrument air. The system will utilize various pieces of equipment to manage these utility streams, such as drainage systems, an oily water separator, and compressors.

6. PROCESS FLOW DIAGRAM

The process flow diagram is provided in Confidential Appendix F.

7. EMISSION CALCULATIONS

This section describes the calculation methodology used to determine the maximum hourly and annual emission rates. Detailed emissions calculations are provided in Appendix G.

7.1. FLARE EMISSIONS (EPN: LBFLARE)

The continuous flare handles the relatively low volume day-to-day vapors to be controlled from both the LB-1 Unit and the Q1 Unit.

The calculations and representations used in this permit amendment are based on best available estimates and should not be considered absolute values for all operating scenarios.

Emissions resulting from pressure relief devices specifically designed to direct gases from units as part of normal operations; venting through control valves by procedure; emissions resulting from the implementation of procedures specifically designed to direct gases from units as part of normal operations, maintenance, shutdown or startup; and emissions resulting from the automatic or manual activation of interlocks and process safety systems specifically designed to direct gasses from units as part of normal operations, shutdown or startup. Venting from to the LB1 Flare is minimized to the extent practicable.

Hourly and annual emissions from the Q1 Unit that are vented to the flare are being updated in this application. In addition, PBR Registration 153695 which authorized additional emissions to the LB-1 Flare is being incorporated into this application. The updated emissions from the flare are shown in the table below.

Table 7-1. Flare Emissions Summary

EPN	Description	Pollutant	Hourly Emissions (lb/hr)	Annual Emissions (TPY)
LBFLARE	LB-1 Flare	CO	307.58	43.21
		NO _x	66.34	8.79
		SO ₂	0.43	0.12
		VOC	453.11	40.14
MSS-LBFLARE	LB-1 MSS Flaring	CO	368.17	34.71
		NO _x	73.74	6.84
		SO ₂	0.42	0.21
		VOC	481.76	16.90

7.2. MSS EMISSIONS (EPN: MSS-LB1-VAC)

With this application, Equistar requests authorization for the use of air mover type vacuum trucks during MSS activities. Per TCEQ guidance, the AP-42 loading loss equation is used to calculate the emissions and multiplied by 2 to account for the air mover type vacuum truck.

8. LOWEST ACHIEVABLE EMISSION RATE (LAER)

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

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

The LAER review takes technical feasibility into account but not economic reasonableness, which is considered in a BACT analysis. LAER costs are considered only to the degree that they reflect unusual circumstances, which differentiate the cost of control for that source from control costs for the rest of the industry.

The La Porte Complex is located in Harris County which is a part of the HGB area designated as severe nonattainment for ozone. NO_x and VOC are the regulated precursors to ozone. VOC emissions from this project exceed the NNSR major source threshold of 25 tpy. Therefore, the proposed project is subject to a LAER analysis for VOC. The main aspect considered when determining LAER for VOC emissions from the LB-1 project was the most stringent emission limitation that is achieved in practice by a specific class or category of facilities as found in a search of the RBLC database.

For the proposed project, the LAER analysis presented below follows this methodology to determine LAER limits for VOC for each source.

8.1. FLARE VOC LAER ANALYSIS

Process emissions from the LB-1 project will be preferentially routed to the site boilers as fuel rather than to the LB-1 Flare. The boilers achieve 99.97% control of VOC in the fuel streams. The LB-1 flare will receive process flows during times of boiler outage or unavailability. The time of flaring will be limited to the maximum extent possible.

Furthermore, maintenance, startup, and shutdown (MSS) emissions associated with the process equipment will be routed to the LB-1 flare. Due to the intermittent frequency of these emissions, the flare is considered LAER for control.

8.2. VACUUM TRUCK VOC LAER ANALYSIS

The ability to use vacuum trucks during MSS activities is being added to the permit with this application. A RACT/BACT/LAER Clearinghouse (RBLC) search was performed to identify potential controls for vacuum trucks. The results of the RBLC search are included in Appendix A. The RBLC entries indicate that materials with a vapor pressure greater than 0.5 psia will be routed to a control device that achieves 98% DRE. Equistar will control emissions from any liquids loaded into vacuum trucks with a vapor pressure greater than 0.5 psia. The control device will achieve 98% DRE. This is considered LAER for the vacuum trucks.

9. BEST AVAILABLE CONTROL TECHNOLOGY

Pursuant to 30 TAC §116.711(2)(C) and TCEQ guidance, a Best Available Control Technology (BACT) analysis is provided for all sources being addressed in this application. BACT is defined in 30 TAC §116.10(1) as “An air pollution control method for a new or modified facility that through experience and research, has proven to be operational, obtainable, and capable of reducing or eliminating emissions from the facility, and is considered technically practical and economically reasonable for the facility.” The affected facilities will utilize BACT, with consideration given to the technical practicability and economic reasonableness of reducing emissions to receive a TCEQ permit. The following discussion demonstrates that the control devices satisfy current TCEQ BACT requirements.

9.1. BACT FOR FLARE (NO_x, CO, AND SO₂)

The flare is designed and operated in accordance with 40 CFR 60.18. The TCEQ considers flares operated in accordance with 40 CFR 60.18 to be BACT for flare operations.

10. FEDERAL NEW SOURCE REVIEW ANALYSIS

As mentioned in Section 1, Equistar is located in Harris County, which at the time of the original permit application was classified as severe non-attainment for ozone and attainment or unclassified area for all other criteria pollutants. The La Porte Complex is considered a major source under the Non-attainment New Source Review (NNSR) program for NO_x and VOC, and Prevention of Significant Deterioration (PSD) program for CO, NO₂, PM, PM₁₀, PM_{2.5} and greenhouse gases. Accordingly for this proposed project, Equistar is subject to the NNSR analysis for NO_x and VOC, and PSD analysis for all other FNSR pollutants. This NNSR/PSD analysis is being conducted for the proposed project's total emission rates.

Equistar has calculated project emissions increases for all the emissions units in the proposed project according to the following steps:

Step 1. Establish Baseline Period and Calculate Baseline Actual Emissions

Per 30 TAC §116.12(3), for existing facilities (other than electric utility steam generating units) baseline actual emissions (**BAE**) are:

The rate, in tons per year, at which the facility actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the ten-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received for a permit...

The LB-1 Unit emission sources are being newly constructed and have a baseline of zero emissions. The HSFLARE is being removed with the addition of the LB-1 Flare. The baseline period for the HSFLARE is 2010-2011.

Step 2. Calculate Project Actual Emissions

Per 30 TAC §116.12(31), project actual emissions (**PAE**) are:

The maximum annual rate, in tons per year, at which an existing facility is projected to emit a federally regulated new source review pollutant in any rolling 12 month period during the five years following the facility resumes regular operation after the project, or in any one of the ten years following the date, if the project involves increasing the facility's design capacity or its potential to emit that federally regulated new source review pollutant...

For the proposed project, the PAE is based on the potential to emit of the new sources.

Step 3. Calculate Project Increases

Per 30 TAC § 116.12(32), for existing facilities, the project emissions increase (**PEI**) is:

The sum of emissions for each modified or affected facility determined using... the difference between the projected actual emissions and the baseline actual emissions. In calculating any increase in emissions that results from the project that portion of the facility's emissions following the project that the facility could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions and that are also unrelated to the particular project, including any increased utilization due to product demand growth may be excluded from

the project emission increase. The potential to emit from the facility following completion of the project may be used in lieu of the projected actual emission rate.

PEI for the project was calculated as the difference between the PAE and the BAE.

Table 10-1. Project Emission Increases for FNSR Analysis Summary

	VOC (tpy)	NO _x (tpy)	CO (tpy)	PM (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	SO ₂ (tpy)
Project Emissions Increase (PEI)	88.15	15.63	77.93	5.24	4.66	1.78	0.33
NNSR SER:	5	5	--	--	--	--	--
PSD SER:	--	40	100	25	15	10	40
Netting Required?	Yes	Yes	No	No	No	No	No
Net Emissions Increase	88.15*	21.56	--	--	--	--	--
NNSR Review Required?	Yes	No	--	--	--	--	--
PSD Review Required?	--	--	No	No	No	No	No

*Equistar has chosen to offset the project, rather than perform contemporaneous netting for VOC.

10.1. NNSR APPLICABILITY

As shown in Table 10-1, the VOC and NO_x emissions increase resulting from the proposed changes (i.e., the project increase) will be greater than NNSR de minimis threshold of 5 tpy. A contemporaneous netting table for NO_x is included in Appendix B. The contemporaneous netting analysis shows that NO_x emissions are less than the major modification threshold of 25 tpy. Therefore, NNSR is not triggered for NO_x. The contemporaneous net increase of VOC is greater than 25 tpy and NNSR is required. Equistar will implement LAER for all new and modified emission sources of VOC. Additionally, Equistar will identify the requisite emission offsets prior to start of construction.

10.1.1. Alternative Site Analysis

FCAA § 173(a)(5) specifies that permits to construct and operate in nonattainment areas may be issued if “an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source demonstrates that benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification.” An alternative site analysis was included in the initial permit application and no changes result from this as-built permit amendment.

10.1.2. Compliance Review

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

10.2. PSD APPLICABILITY

As shown in Table 10-1, the project increases for CO, SO₂, NO₂, PM, PM₁₀, and PM_{2.5} are less than respective PSD thresholds for each pollutant. Therefore, PSD analysis is not required.

11. GENERAL APPLICATION REQUIREMENTS

According to the instructions for filing an Air Quality Permit PI-1 form, the permit application must address the General Application requirements, as specified in 30 TAC §116.111. The requirements are listed and addressed in the following section.

§116.111. General Application.

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

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

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

(2) Information which demonstrates that all of the following are met.

(2)(A) Protection of public health and welfare.

(2)(A)(i) The emissions from the proposed facility will comply with all rules and regulations of the commission and with the intent of the TCAA, including protection of the health and physical property of the people.

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

Chapter 101 - General Rules: The LB-1 Unit will be operated in accordance with all applicable requirements in Chapter 101. Specifically, the facilities will be operated in accordance with the Chapter 101 General Rules relating to circumvention, nuisance, traffic hazard, notification and recordkeeping requirements for emission events and for startup/shutdown/maintenance, sampling and sampling port procedures, emissions inventory requirements, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Ambient Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

Chapter 111 - Control of Air Pollution from Visible Emissions and Particulate Matter: The facility will comply with the allowable opacity standards in 30 TAC §111.111 and the particulate matter (PM) emission rate specified in 30 TAC §111.151. In addition, Equistar will comply with the outdoor burning restrictions in 30 TAC §111.201. The La Porte Complex is located outside of the loop formed by Beltway 8; therefore, §111.143-§111.149 do not apply.

Chapter 112 - Control of Air Pollution from Sulfur Compounds: The facility will comply with all applicable requirements of Chapter 112.

Chapter 113 - Control of Air Pollution from Toxic Materials: Chapter 113 regulates the emission of radionuclides (40 CFR 61, Subpart R), municipal solid waste landfills, hospital/medical/infectious waste incinerators, and hazardous air pollutants for source categories (40 CFR 63). There will be no emissions of radionuclides and the La Porte Complex is not a municipal solid waste landfill and does not have a hospital/medical/infectious waste incinerator. Emissions from hazardous air pollutants are regulated under the MACT program, addressed in the discussion of compliance with *Chapter 122* in item (2)(F) below.

Chapter 114 – Control of Air Pollution from Motor Vehicles: All motor vehicles owned or operated by Equistar will comply with the applicable provisions of this regulation including maintenance and operation of air pollution control systems or devices, inspection requirements, equipment evaluation procedures for vehicle exhaust gas analyzers, and use of oxygenated fuels.

Chapter 115 – Control of Air Pollution from Volatile Organic Compounds (VOC): The LB-1 Unit will comply with all applicable requirements in Chapter 115. The LB-1 Unit is subject to the requirements for storage tanks, process vents, fugitive components, and HRVOC processes and is in compliance with the standards, recordkeeping, and reporting requirements associated with these regulations.

Chapter 117 – Control of Air Pollution from Nitrogen Compounds: The LB-1 Unit will be operated in accordance with all applicable requirements in Chapter 117. The La Porte Complex is located in Harris County and is subject to the requirements in Division 3 of Subchapter B of Chapter 117. The only combustion source in the LB-1 unit is the flare. Flares are exempt from the requirements of Chapter 117.

Chapter 118 – Control of Air Pollution Episodes: The LB-1 Unit will be operated in compliance with the rules relating to generalized and localized air pollution episodes.

Chapter 122 – Federal Operating Permits: Title V Permit No. O1606 has been issued for the Polymers Area of the La Porte Complex. The LB-1 Unit will be added to this permit and be operated in accordance with its requirements.

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

There is no school located within 3,000 feet of the facility. Therefore, this requirement is not applicable.

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

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

(2)(C) Best available control technology (BACT) must be evaluated for and applied to all facilities subject to the TCAA. Prior to evaluation of BACT under the TCAA, all facilities with pollutants subject to regulation under Title I Part C of the Federal Clean Air Act (FCAA) shall evaluate and apply BACT as defined in §116.160(c)(1)(A) of this title (relating to Prevention of Significant Deterioration Requirements).

BACT requirements are addressed in Section 9.

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

All of the new/modified facilities in the proposed project will comply with the applicable NSPS rules. Detailed regulatory applicability and compliance is covered under the Title V program. The LB-1 Unit will operate under Federal Operating Permit No. O1606.

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

All of the new/modified facilities in the proposed project will comply with the applicable NESHAP rules. Detailed regulatory applicability and compliance is covered under the Title V program. The LB-1 Unit will operate under Federal Operating Permit No. O1606.

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

All of the new/modified facilities in the proposed project will comply with the applicable MACT rules. Detailed regulatory applicability and compliance is covered under the Title V program. The LB-1 Unit will operate under Federal Operating Permit No. O1606.

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

The LB-1 Unit will achieve the performance as represented in this permit application.

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

A nonattainment analysis is included in Section 10.1. The project triggers NNSR for VOC emissions.

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

The facility is operating in an attainment area for SO₂, PM₁₀, PM_{2.5}, CO, NO₂ and lead. As demonstrated in Section 10.2, the emission increases of these pollutants are less than the significance levels. Therefore, no PSD review is required.

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

An impacts analysis is included in Appendix D.

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

The LB-1 Unit is not a major source of HAPs and therefore does not meet the definition of affected source as defined in §116.15(1).

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

The La Porte Complex is located in the Houston/Galveston/Brazoria area. Equistar will comply with the mass emissions cap and trade program.

12. PERMIT FEE

Pursuant to 30 TAC Section §116.141, the permit amendment fee for a construction permit application is based on the total estimated capital cost of the proposed project. The permit fee is determined as 0.3% of the capital cost of the proposed project with a minimum fee of \$900 and a maximum fee of \$75,000.

There is no capital cost associated with this project; therefore, the associated permit application fee is \$900. The fee was paid electronically. Table 30 is included at the end of this section.



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.texas.gov/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	\$0

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

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: Equistar Chemicals, LP

Company Representative Name (*please print*): Christopher M. Cain

Title: Complex Manager

Company Representative Signature:

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

*A single PSD fee (calculated on the capital cost of the project per 30 TAC § 116.163) will be required for all of the associated permitting actions for a GHG PSD project. Other NSR permit fees related to the project that have already been remitted to the TCEQ can be subtracted when determining the appropriate fee to submit with the GHG PSD application; please identify these other fees in the GHG PSD permit application.

Permit Application Fee (from table above) = \$900

Date:

APPENDIX A: RBLC RESULTS

RBLCID	FACILITY NAME	CORPORATE OR COMPANY NAME	FACILITY COUNTY	FACILITY STATE	PERMIT NUM	PROCESS NAME	POLLUTANT	CONTROL METHOD DESCRIPTION	EMISSION LIMIT 1	EMISSION LIMIT 1 UNIT	PERCENT EFFICIENCY	EMISSION LIMIT 2	EMISSION LIMIT 2 UNIT
TX-0592	CORPUS CHRISTI WEST REFINERY	VALERO REFINING-Texas LP	NUECES	TX	38754 AND PSDTX324M13	Vacuum Trucks	Volatile Organic Compounds (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	98	3.1	T/YR
TX-0595	CORPUS CHRISTI EAST REFINERY	VALERO REFINING-Texas LP	NUECES	TX	2937 AND PSDTX1023M2	Vacuum Trucks	Volatile Organic Compounds (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	98	9.2	T/YR
TX-0852	CORPUS CHRISTI WATERFRONT TERMINAL	MAGELLAN TERMINALS HOLDINGS, L.P.		TX	145717 AND PSDTX1516	Vacuum Trucks	Volatile Organic Compounds (VOC)	CARBON ABSORPTION SYSTEM	100	PPMV	0	0	

APPENDIX B: FEDERAL NSR TABLES



**TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES¹**

Company: Equistar Chemicals, LP	
Permit Application Number:	Criteria Pollutant: NOx

Project Date ²	Facility at Which Emission Change Occurred ³	Permit No.	Project Name or Activity	Baseline Period (years)	A	B	Difference (A-B) ⁶	Creditable Decrease or Increase ⁷		
					Proposed Emissions (tons/year) ⁴	Baseline Emissions (tons/year) ⁵				
1. 5/22/2012	QE8050B	QE8050B	18978	Amendment	2007/2008	23.20	23*	0.2	0.2	
2. 2014	QE1010B	QE1010B	18978	Amendment		24.09	0.0		0.0**	
3. 2014	QE1011B	QE1011B	18978	Amendment		24.09	0.0		0.0**	
4. 2014	QE3050B	QE3050B	83822	Amendment		2.21	0.07	2.14	0.0**	
5. 2014	QE8050B	QE8050B	83822	Amendment		11.66	1.0	10.66	0.0**	
6. 2/19/2016	LBFLARE	LBFLARE	114809	LB-1		8.03	0.0	8.03	8.03	
7. 2/19/2016	HSFLARE	HSFLARE	114809	LB-1	2010-2011	0.00	-3.38	-3.38	-3.38	
8. 2/19/2016	LBEFLARE	LBEFLARE	114809	LB-1		0.37			0.37	
9. 5/5/2017	LBEFLARE	LBEFLARE	114809	LB-1 Amendment		0.00	0.37		-0.37	
Page Subtotal⁸									4.85	
Summary of Contemporaneous Changes						Total				21.42

*End points method used for this EPN.
 **These emissions were offset and credits were retired at a ratio of 1.3/1.

¹ Individual Table 3F=s should be used to summarize the project emission increase and net emission increase for each criteria pollutant.
² The start of operation date for the modified or new facilities. Attach Table 4F for each project reduction claimed.
³ Emission Point No. as designated in NSR Permit or Emissions Inventory.
⁴ All records and calculations for these values must be available upon request.
⁵ All records and calculations for these values must be available upon request.
⁶ Proposed (column A) - Baseline (column B).
⁷ If portion of the decrease not creditable, enter creditable amount.
⁸ Sum all values for this page.



**TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES⁹**

Company: Equistar Chemicals, LP	
Permit Application Number:	Criteria Pollutant: NOx

Project Date ¹⁰	Facility at Which Emission Change Occurred ¹¹	Permit No.	Project Name or Activity	Baseline Period (years)	A	B	Difference (A-B) ¹⁴	Creditable Decrease or Increase ¹⁵		
					Proposed Emissions (tons/year) ¹²	Baseline Emissions (tons/year) ¹³				
FIN	EPN									
1.	3/26/2019	LBFLARE	LBFLARE	114809	LB-1 Amendment		8.68	8.03	0.65	0.65
2.	3/26/2019	LBFLARE-MSS	LBFLARE-MSS	114809	LB-1 Amendment		1.31	0.0	1.31	1.31
3.	5/2019	LBFLARE	LBFLARE	114809	LB-1 Amendment		8.79	8.68	0.11	0.11
4.	5/2019	LBFLARE-MSS	LBFLARE-MSS	114809	LB-1 Amendment		6.84	1.31	5.53	5.53
5.	1/26/2015	QE8050B	QE8050B	126212	PBR		0.001	0.0	0.001	0.001
6.	12/30/2015	L3FLARE	L3FLARE	4477	AB3 Amendment	2011-2012	2.02	0.96	1.06	1.06
7.	9/8/2015	L3FLARE	L3FLARE	134079	PBR		0.01	0.0	0.01	0.01
8.	9/11/2017	Q1INC	Q1INC	138607	PBR		1.73	0.0	1.73	1.73
Page Subtotal¹⁶										10.40

⁹ Individual Table 3F=s should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

¹⁰ The start of operation date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

¹¹ Emission Point No. as designated in NSR Permit or Emissions Inventory.

¹² All records and calculations for these values must be available upon request.

¹³ All records and calculations for these values must be available upon request.

¹⁴ Proposed (column A) - Baseline (column B).

¹⁵ If portion of the decrease not creditable, enter creditable amount.



**TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES¹⁷**

Company: Equistar Chemicals, LP	
Permit Application Number:	Criteria Pollutant: NOx

Project Date ¹⁸	Facility at Which Emission Change Occurred ¹⁹		Permit No.	Project Name or Activity	Baseline Period (years)	A		B		Creditable Decrease or Increase ²³	
	FIN	EPN				Proposed Emissions (tons/year) ²⁰	Baseline Emissions (tons/year) ²¹	Difference (A-B) ²²			
1.	9/20/2017	QE18050B	QE18050B	148085	PBR		0.01	0.0	0.01	0.01	
2.	6/7/2018	QE1AIRCOMP	QE1AIRCOMP	151971	PBR		0.68	0.0	0.68	0.68	
3.	8/17/2018	L3RTO	L3RTO	152926	PBR		0.13	0.0	0.13	0.13	
4.	10/25/2018	L3FLARE	L3FLARE	153696	Standard Permit		0.001	0.0	0.001	0.001	
5.	1/17/2019	QE8050B	QE8050B	154294	PBR		0.01	0.0	0.01	0.01	
6.	3/29/2019	L3ThermOx	L3ThermOx	156014	Standard Permit		0.01	0.0	0.01	0.01	
7.											
8.											
Page Subtotal²⁴											0.84

¹⁶ Sum all values for this page.

¹⁷ Individual Table 3F=s should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

¹⁸ The start of operation date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

¹⁹ Emission Point No. as designated in NSR Permit or Emissions Inventory.

²⁰ All records and calculations for these values must be available upon request.

²¹ All records and calculations for these values must be available upon request.

²² Proposed (column A) - Baseline (column B).

²³ If portion of the decrease not creditable, enter creditable amount.

²⁴ Sum all values for this page.



**TABLE 3F
PROJECT CONTEMPORANEOUS CHANGES²⁵**

Company: Equistar Chemicals, LP	
Permit Application Number:	Criteria Pollutant: NOx

Project Date ²⁶	Facility at Which Emission Change Occurred ²⁷	Permit No.	Project Name or Activity	Baseline Period (years)	A		B		Creditable Decrease or Increase ³¹	
					Proposed Emissions (tons/year) ²⁸	Baseline Emissions (tons/year) ²⁹	Difference (A-B) ³⁰			
1.	5/10/2013	VAM Analyzers	VAM Analyzers	108786	PBR		0.04	0.0	0.04	0.04
2.	2/19/2015	VAFLARE	VAFLARE	129607	PBR		0.58	0.0	0.58	0.58
3.	6/15/2015	VAFLARE	VAFLARE	131915	PBR		0.15	0.0	0.15	0.15
4.	10/8/2018	AAFLARE	AAFLARE	5040	Acetic Amendment	2010-2011	3.27	2.92	0.35	0.35
5.	3/30/2018	VAWWENG	VAWWENG	150783	PBR		4.07	0.0	4.07	4.07
6.	8/24/2018	VAFLARE	VAFLARE	153099	PBR		0.01	0.0	0.01	0.01
7.	11/12/2018	VAFLARE	VAFLARE	154109	PBR		0.13	0.0	0.13	0.13
Page Subtotal³²										5.33

²⁵ Individual Table 3F=s should be used to summarize the project emission increase and net emission increase for each criteria pollutant.

²⁶ The start of operation date for the modified or new facilities. Attach Table 4F for each project reduction claimed.

²⁷ Emission Point No. as designated in NSR Permit or Emissions Inventory.

²⁸ All records and calculations for these values must be available upon request.

²⁹ All records and calculations for these values must be available upon request.

³⁰ Proposed (column A) - Baseline (column B).

³¹ If portion of the decrease not creditable, enter creditable amount.

³² Sum all values for this page.

APPENDIX C: REQUESTED CHANGES TO SPECIAL CONDITIONS

Equistar requests the following changes to Special Conditions in NSR Permit No. 114809. ~~Strikethroughs~~ represent current permit language that Equistar requests to remove. Underline represents new language that Equistar requests to add.

- Please revise the table in Special Condition 11E as follows:

EPN	Minimum Pressure Drop (inches water gauge)	Maximum Pressure Drop (inches water gauge)
LBF806 (Note 1)	0.2 <u>0.05</u>	8.3 <u>15</u>
LBF807	0.05	15
LBF816	0.05	15
LB30-F-965	0.05	15
LB30-F-900A	0.05	15
LB30-F-900B	0.05	15
LBBL980	0.05	15

- Please remove Special Condition 21. This condition requires stack testing of particulate matter sources. The sources have very low permitted emissions of particulate matter, and it is expected that the limits will be at or near the detection limit of the test methods. Another potential issue with performing stack testing on these sources is their low exhaust flow rate. Special Conditions 11 and 12 require that there be no visible emissions from the vents. In addition, Special Condition 11E requires continuous monitoring of the differential pressure across the filter vents. These requirements are sufficient to demonstrate compliance with the permit limits and additional stack testing is not required.
- Special Condition 27 currently limits the control device that may be used for MSS activities to the LB-1 Flare. Equistar requests that TCEQ add the ability to control MSS emissions using carbon adsorption systems, temporary thermal oxidizers, temporary flares, and temporary liquid scrubbing systems.
- The footnote to Attachment C indicates that the total hours of routing the Q1 Incinerator to LBFLARE shall not exceed 150 hours per year. The flare calculation updates included in this application have increased the hours of incinerator reroute to 300 hours per year. Please update the footnote accordingly.

APPENDIX D: IMPACTS ANALYSIS



AIR QUALITY MODELING REPORT
Equistar Chemicals, L.P.

La Porte Complex
Harris County, Texas
NSR Permit No. 114809

Prepared By:

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

May 2019

Project 194402.0086



Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	1-1
2. PROJECT OVERVIEW	2-1
2.1. State NAAQS Analysis	2-1
<i>2.1.1. Secondary PM_{2.5}</i>	<i>2-1</i>
2.2. State Property Line Analysis	2-3
2.3. State Health Effects Evaluation (ESL Evaluation)	2-3
3. AREA MAP	3-1
4. PLOT PLAN	4-1
5. MODELING EMISSIONS INVENTORY	5-1
5.1. Source Parameters	5-1
<i>5.1.1. Point Sources</i>	<i>5-1</i>
<i>5.1.2. Area Sources</i>	<i>5-2</i>
5.2. Modeled Emission Rates Determination	5-2
6. SELECTION OF MODEL OPTIONS	6-1
7. TERRAIN	7-1
8. BUILDING WAKE EFFECTS (DOWNWASH)	8-1
8.1. General Discussion	8-1
8.2. Building Dimensions	8-2
9. RECEPTOR GRIDS	9-1
10. METEOROLOGICAL DATA	10-1
11. MODELING RESULTS	11-1
11.1. State NAAQS Analysis	11-1
11.2. State Property Line Analysis	11-1
11.3. State Health Effects Evaluation	11-2
<i>11.3.1. Step 1</i>	<i>11-2</i>
<i>11.3.2. Step 2</i>	<i>11-2</i>
<i>11.3.3. Step 3</i>	<i>11-2</i>
<i>11.3.4. Steps 4 and 5</i>	<i>11-3</i>
<i>11.3.5. Step 6</i>	<i>11-3</i>
12. ELECTRONIC FILES	12-1
APPENDIX A: LIST OF BUILDINGS/STRUCTURES CONSIDERED IN MODELING	A-1
APPENDIX B: SOURCE PARAMETERS AND EMISSION RATES	B-1
APPENDIX C: PLOT PLAN	C-1
APPENDIX D: AERSURFACE OUTPUT	D-1

1. EXECUTIVE SUMMARY

LyondellBasell owns and operates a chemical manufacturing complex in La Porte, Harris County, Texas (La Porte Complex). The complex is divided into two operating areas and each area operates under a unique Texas Commission on Environmental Quality (TCEQ) Regulated Entity Number (RN) and Customer Number (CN) number:

- Olefins Unit and Polymers Units operated by Equistar Chemicals, LP (RN: 100210319, CN: 600124705), and
- Glacial Acetic Acid and Vinyl Acetate Monomer Units operated by LyondellBasell Acetyls, LLC (RN: 100224450, CN: 603674862).

NSR Permit 114809 and N190 authorize routine and MSS emissions from the LB-1 unit. The LB-1 unit will produce polyethylene solids. Since the issuance of the permit on February 19, 2016, design changes have occurred which will affect air emissions. A permit amendment application is being submitted to authorize the design changes. Equistar has completed the State NAAQS and State Health Effects evaluation for the total emissions included in the current amendment application.

This document summarizes the methodologies used for the TCEQ State NAAQS, State Property Line Analysis, and Health Effects Evaluations, the data used to conduct the analyses, and the results of these analyses. The methodologies used to perform these analyses are consistent with Modeling and Effects Review Applicability (MERA) guidance package, the TCEQ's *Air Quality Modeling Guidelines*, and the EPA's *Guideline on Air Quality Models (Revised)*.^{1,2,3}

¹ Code of Federal Regulations, Title 40-Protection of Environment, Part 51, Appendix W, January 17, 2017.

² TCEQ, Air Quality Modeling Guidelines, APDG 6232v4 (Revised), Air Permits Division, Austin, TX, September 2018.

³ TCEQ, Modeling and Effects Review Applicability (MERA), APDG 5874v5, March 2018.

2. PROJECT OVERVIEW

This section presents a summary of the pollutants evaluated.

2.1. STATE NAAQS ANALYSIS

The project annual emissions increases of NO_x, CO, SO₂, PM₁₀, and PM_{2.5} must be modeled in State NAAQS. For the State NAAQS analysis, a preliminary impacts determination, which considers project emissions increases associated with the affected sources at the facility, was performed to determine whether the proposed emissions of NO_x, CO, SO₂, PM₁₀, and PM_{2.5} will have a significant impact upon the area surrounding the facility. The maximum modeled ground-level concentrations (H1H) for each pollutant for each averaging period evaluated were compared to the corresponding SILs to determine whether the maximum modeled ground-level concentration (GLC_{max}) at any receptor exceeds the applicable SIL. The SILs are presented in Table 2-1. For these pollutants, if the GLC_{max} resulting from project emissions increases exceeds the corresponding SIL, a State NAAQS Analysis may be required.

Table 2-1. Scope of Modeling Review for State NAAQS Analysis

Pollutant	Averaging Period	Modeling Significance Level (SIL/MSL) (µg/m³)	NAAQS (µg/m³)
NO ₂	1-hour	7.5	188
	Annual	1	100
CO	1-hour	2,000	40,000
	8-hour	500	10,000
SO ₂	1-hour	7.8	196
	3-hour	25	1,300
	24-hour	5	365
	Annual	1	80
PM _{2.5} ^A	24-hour	1.2	35
	Annual	0.2	12
PM ₁₀	24-hour	5	150

^A PM_{2.5} SIL values presented in EPA memo "Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program", April 17, 2018.

2.1.1. Secondary PM_{2.5}

An evaluation of PM_{2.5} includes both direct PM_{2.5} emissions and secondary PM_{2.5} precursor emissions. Direct PM_{2.5} emissions are assessed by modeling the PM_{2.5} using practices outlined in this report. This section addresses the assessment of secondary PM_{2.5}.

In addition to direct emissions of PM_{2.5}, emissions of NO_x and SO₂ can lead to formation of PM_{2.5} via photochemical reactions transforming these pollutants into nitrate and sulfate particulates. These nitrate and sulfate particulates are called secondary PM_{2.5}. EPA has promulgated a two-tiered approach to assess secondary PM_{2.5} impacts; Tier 1 uses technically credible relationships between precursor emissions and a source's impact

to estimate said source's secondary impact. In accordance with TCEQ⁴ guidance, the secondary PM_{2.5} impacts are assessed using the Tier 1 demonstration tool for PM_{2.5} precursor emissions, NO_x and SO₂, called Modeled Emission Rates for Precursors (MERPS) developed by the EPA.⁵ The critical thresholds used will be the recommended SILs of 1.2 µg/m³ for 24-hour and 0.2 µg/m³ for the annual averaging periods, as mentioned in Section 2.1 above.

The first step is to define the applicable MERP to use in the secondary PM_{2.5} assessment. Conservatively, the worst-case derived MERPs for hypothetical Texas sources, as presented in the TCEQ modeling guidance, will be used. These MERPs are summarized in Table 2-1 below.

Table 2-1. Worst-Case Texas MERP Values

Precursor	24-hour PM _{2.5}	Annual PM _{2.5}
NO _x	2500	10000
SO ₂	343	1801

1. Worst-case MERP Values (in tpy) according to Appendix R of TCEQ Modeling Guidelines

The secondary PM_{2.5} impact concentration can be quantified based on the MERPs and the precursor project increases using the equation below.

$$\text{Concentration } (\mu\text{g}/\text{m}^3) = \left[\frac{\text{NO}_x \text{ Project Emissions (tpy)}}{\text{NO}_x \text{ MERP (tpy)}} + \frac{\text{SO}_2 \text{ Project Emissions (tpy)}}{\text{SO}_2 \text{ MERP (tpy)}} \right] * \text{SIL}$$

The secondary PM_{2.5} impact concentration for this project is calculated below for both the 24-hour and annual basis.

24-hour:

$$\text{Concentration } (\mu\text{g}/\text{m}^3) = \left[\frac{8.79 + 6.84}{2500} + \frac{0.12 + 0.21}{343} \right] * 1.2 = 0.009 \mu\text{g}/\text{m}^3$$

Annual:

$$\text{Concentration } (\mu\text{g}/\text{m}^3) = \left[\frac{8.79 + 6.84}{10000} + \frac{0.12 + 0.21}{1801} \right] * 0.2 = 0.0003 \mu\text{g}/\text{m}^3$$

These secondary impact concentrations are then added to the direct PM_{2.5} impact from modeling to determine the total PM_{2.5} concentration for comparison to the SIL using the equation below.

$$\text{Total concentration} = \text{Model direct concentration} + \text{Secondary concentration}$$

Model direct concentrations = Results of PM_{2.5} preliminary impact determination model.

⁴ Appendix R, TCEQ Air Dispersion Modeling Guidelines, APDG 6232v4 (Revised), September 2018.

⁵ Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM_{2.5} under the PSD Permitting Program. EPA-454/R-16-006. December 2, 2016.

2.2. STATE PROPERTY LINE ANALYSIS

A property line analysis is required for SO₂ in accordance with Title 30 Texas Administrative Code (TAC) Chapter 112. The maximum modeled ground level concentration at the fenceline of SO₂ should not exceed the thresholds listed below in Table 2-3. The H1H SO₂ concentration for the 1-hour averaging period is determined using AERMOD; this GLC_{max} is then compared to the standard presented below.

Table 2-3. Scope of Modeling Review for Property Line Analysis

Pollutant	Regulation/ Guidance	Averaging Period	Standard (µg/m ³)
SO ₂	30 TAC 112.3(b)	30-min	715 ^A

^A The 30-minute standard of 0.28 ppm (715 µg/m³) for Harris County is evaluated using the model's 1-hr averaging period.

2.3. STATE HEALTH EFFECTS EVALUATION (ESL EVALUATION)

As mentioned in Section 1 of this report, the State Health Effects Evaluation is based on the March 2018 TCEQ MERA guidance package. The TCEQ MERA guidance document provides a flowchart to be used to determine the required scope of the modeling and effects review for each compound required to be included in the analysis. The flowchart provides a process to determine if refined air dispersion modeling or effects review is required for a permitting project, and if required, the minimum requirements for the scope of the modeling and effects review. The MERA guidance document requires comparison to the Effects Screening Level (ESL) for each compound under consideration. A list of the compounds evaluated in this analysis, along with the corresponding hourly and annual ESLs for each are provided in Table 2-4.

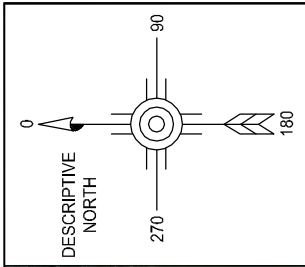
Table 2-4. Pollutants to be Evaluated and Associated Effects Screening Levels

Component	CAS No.	Short-term ESL (µg/m ³) ^A	Long-term ESL (µg/m ³) ^A
Tetrachloroethylene	127-18-4	2,000	26
Butene	106-98-9	19,000	1,600
Ethylene	74-85-1	1,400	34
Hexene	592-41-6	1,700	170
Isopentane	78-78-4	59,000	7,100
Propane	74-98-6	Simple Asphyxiant	Simple Asphyxiant
n-Hexane	110-54-3	5,600	200
1-Pentene	109-67-1	290	480
n-Butane	106-97-8	66,000	7,100
iso-Hexane	107-83-5	5,600	200
Mineral Spirits	64475-85-0	3,500	350
Propylene	115-07-1	Simple Asphyxiant	Simple Asphyxiant
Lube Oil	N/A	1,000	100
Ethylene Glycol	107-21-1	450	4.5

^A Texas Air Monitoring Information System (TAMIS), Tox ESL-Summary Report, Effective Date: 5/24/2018.

3. AREA MAP

The project will be located at Equistar's La Porte Complex, 1515 Miller Cut-Off Road, La Porte, Texas 77571. The plant is situated along the Houston Ship Channel at Latitude 29°43'03" North, Longitude 95°04'05" West. An area map is provided in Figure 3-1.



REFERENCE DRAWINGS	

NOTES

NO.	DATE	DESCRIPTION	BY	APPR.

NO.	DATE	DESCRIPTION	BY	APPR.
2	09/2013	ADDED LB-1	CC	GW
1	08/03/12	PER ENVIRON. DEPT. COMMENTS	CC	GW
0	9/30/2010	QE-1 AMENDMENT	CC	GW

REVISIONS

This drawing is the property of an affiliate of LyondellBasell Industries and may not be used, reproduced, published or disclosed to others without its written authorization. This drawing is provided to others only for the purpose of producing items on order for LyondellBasell Industries or its licensees. It is not to be used in any way detrimental to LyondellBasell Industries and is subject to return upon request.

EQUISTAR

Equistar Chemicals, LP and LyondellBasell Acetylene, LLC
 1515 Miller Cut-Off Road
 La Porte, TX 77571

P.O. Drawer D
 Deer Park, TX 77536

LA PORTE COMPLEX FIGURE 1-1 AREA MAP				DRAWING NO. D-00-D03-17000
DATE	09/2010	SCALE	1"=200'	
DRAWN BY	CC	CHECKED BY		
DEPT. APPR.		ENG. APPR.		
LOCATION	DRAWING NO.		ISSUE	
D-00-D03-17000			2	

4. PLOT PLAN

A plot plan depicting the locations of the Equistar facility modeled sources and building structures is provided in Appendix C. The property line for the site is included in the Area Map provided in Section 3.

In all air quality dispersion modeling analysis input and output data files, the location of emission sources, structures, and receptors are represented in the Universal Transverse Mercator (UTM) coordinate system. The U.S. EPA and the TCEQ require that coordinates for permits and air quality dispersion modeling analyses be represented in the UTM system. The UTM grid was originally created by the Defense Mapping Agency of the United States as a special grid for military use throughout the world. In this grid, the world is divided into 60 north-south zones, each covering a strip 6° wide in longitude. The Equistar La Porte Complex is located in UTM Zone 15. In each zone, coordinates are measured north and east in meters. The northing values are measured continuously from zero at the Equator, in a northerly direction. A central meridian through the middle of each 6° zone is assigned an easting value of 500,000 meters (m).

5. MODELING EMISSIONS INVENTORY

All on-site project related emissions sources, including fugitive releases, are represented as point, pseudo-point, or area sources for modeling purposes. The following sections describe the methodology that was used to characterize the source parameters for the sources under consideration as well as the methodology used to determine the emission rates for each of the sources. A summary of the on-property source parameters and emission rates associated with this project is included in Appendix B of this report.

5.1. SOURCE PARAMETERS

The following procedures were utilized to develop the source inventory for the point sources at the LB-1 Unit:

5.1.1. Point Sources

➤ Flares are modeled using the following parameters, per TCEQ guidance:

- Velocity = 20 m/s
- Temperature = 1,273 K
- The heat release and effective flare diameter are calculated using the following methodology using TCEQ guidance.

To model emissions from the flares, stack parameters are determined using TCEQ guidance obtained from the *Air Quality Modeling Guidelines*⁶. The effective stack diameter (D) is calculated using the following equations:

$$D(m) = \sqrt{(10^{-6}) \times (q_n)}$$

$$q_n = q \times (1 - 0.048\sqrt{MW})$$

Where:

q = normal gross heat release of hypothetical flared material

MW = molecular weight of hypothetical flared material

The effective flare diameter calculations for LB-1 Flare and LB-1 Flare MSS are included in Appendix B.

➤ Sources with raincaps or horizontal discharges are modeled as pseudo-point sources with the following parameters:

Velocity = 0.001 m/s

Diameter = 0.001 m

Temperature = Actual temperature

⁶ Texas Commission on Environmental Quality, Air Quality Modeling Guidelines, APDG-6232, Austin, TX, April 2015, p. 73.

5.1.2. Area Sources

The fugitive emissions associated with leakages from process piping and equipment, vent headers, tank piping and buildings are represented as area sources. For area sources, the dimensions (i.e. length and width) of the modeled source are determined based on the geographical location where emissions could occur. Release heights are reflective of the midway height from ground-level to the maximum potential release height as representative emissions are equally distributed throughout the source area. The source parameters are based on the physical dimensions of the source. Area sources are depicted geographically using the southwest corner as a pivot point and the axis degrees as an indicator of the source configuration relative to the pivot.

5.2. MODELED EMISSION RATES DETERMINATION

In the development of various source emission rates at the LB-1 Unit, the following methodology was used:

- For NO_x, CO, and SO₂ emissions, the allowable emission rates from the Table 1(a) were used.
- For the annual PM_{2.5} emissions, the allowable emission rates from the Table 1(a) were used.
- For the 24-hour PM₁₀ and PM_{2.5} analysis, the hourly emission rates were adjusted based on the maximum number of hours each source could vent in a 24-hour period.

6. SELECTION OF MODEL OPTIONS

The version dated 18081 of the AERMOD air dispersion model was used to estimate maximum ground-level off property concentrations of CO, NO₂, SO₂, PM₁₀, and PM_{2.5}.⁷

In this analysis, modeling was performed using the regulatory default options, which include stack heights adjusted for stack-tip downwash, buoyancy-induced dispersion, and final plume rise. Ground-level concentrations occurring during “calm” wind conditions were calculated by the model using the calm processing feature. Regulatory default values for wind profile exponents and vertical potential temperature gradients were used since no representative on-site meteorological data are available. As per U.S. EPA requirements, direction-specific building dimensions were used in the downwash algorithms.

⁷ EPA, Office of Air Quality Planning and Standards, Federal Register Vol. 70 / No. 216, pp. 68,218-68,261, 40 CFR 51, Appendix W, Revision to Guideline on Air Quality Models, November 9, 2005.

7. TERRAIN

The La Porte Complex is located in Harris County, Texas. The terrain surrounding the La Porte Complex varies in elevation from 0 feet (0 meters) to 120 feet (36 meters) within 50 km of the La Porte Complex. The average elevation at the La Porte Complex is approximately 25 feet (7.62 meters) above mean sea level.

AERMOD uses advanced terrain characterization to account for the effects of terrain features on plume dispersion and travel. AERMOD's terrain pre-processor, AERMAP, imports digital terrain data and computes a height scale for each receptor from National Elevation Database (NED) data files. A height scale is assigned to each individual receptor and is used by AERMOD to determine whether the plume will go over or around a hill.

The receptor terrain elevations input into AERMAP are the highest elevations extracted from United States Geological Survey (USGS) Seamless database. The data extracted was 1/3 arc second (30 m) data for the area. For each receptor, the maximum possible elevation within a box centered on the receptor of concern and extending halfway to each adjacent receptor was chosen. This is a conservative technique for estimating terrain elevations in that it ensures that the highest terrain elevations are accounted for in the analysis. Source and building elevations are extracted in the same manner, using interpolated elevation values.

All existing and proposed sources and buildings were included at their actual heights above their respective ground level elevations.

8. BUILDING WAKE EFFECTS (DOWNWASH)

The emission sources are evaluated in terms of their proximity to nearby structures. The purpose of this evaluation is to determine if stack discharges might become caught in the turbulent wakes of these structures. Wind blowing around a building creates zones of turbulence that are greater than if the building was absent.

8.1. GENERAL DISCUSSION

EPA has promulgated stack height regulations that restrict the use of stack heights in excess of “Good Engineering Practice” (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. The minimum stack height not subject to the effects of downwash, called the GEP stack height, is defined by the following formula:

$$H_{GEP} = H + 1.5L, \text{ where:}$$

H_{GEP} = minimum GEP stack height,
H = structure height, and
L = lesser dimension of the structure (height or projected width).

This equation is limited to stacks located within 5L of a structure. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure. The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis were determined using BPIP. In general, the lowest GEP stack height for any source is 65 meters by default.⁸ The LB-1 Flare (Model ID LBFLARE and LBFLRMSS) exceeds a stack height of 65 m. LBFLARE and LBFLRMSS were modeled at a stack height of 65 m.

Direction-specific building dimensions and the dominant downwash structure parameters used as inputs to the dispersion models were determined using the *BREEZE-WAKE/BPIP* software, developed by Trinity Consultants, Inc. This software incorporates the algorithms of the U.S. EPA-sanctioned Building Profile Input Program with PRIME enhancement (BPIP-PRIME), version 04274.⁹ BPIP-PRIME is designed to incorporate the concepts and procedures expressed in the GEP Technical Support document, the Building Downwash Guidance document, and other related documents.

The output from the BPIP-PRIME downwash analysis lists the names and dimensions of the structures, and the emission unit locations and heights. In addition, the output contains a summary of the dominant structure for each emission unit (considering all wind directions) and the actual building height and projected widths for all wind directions. This information is then incorporated into the data input files for the AERMOD air dispersion model.

All existing and proposed sources and buildings were included at their actual heights above their respective ground level elevations.

⁸ 40 CFR §51.100(ii).

⁹ U.S. Environmental Protection Agency, *User's Guide to the Building Profile Input Program*, Research Triangle Park, NC, EPA-454/R-93-038.

8.2. BUILDING DIMENSIONS

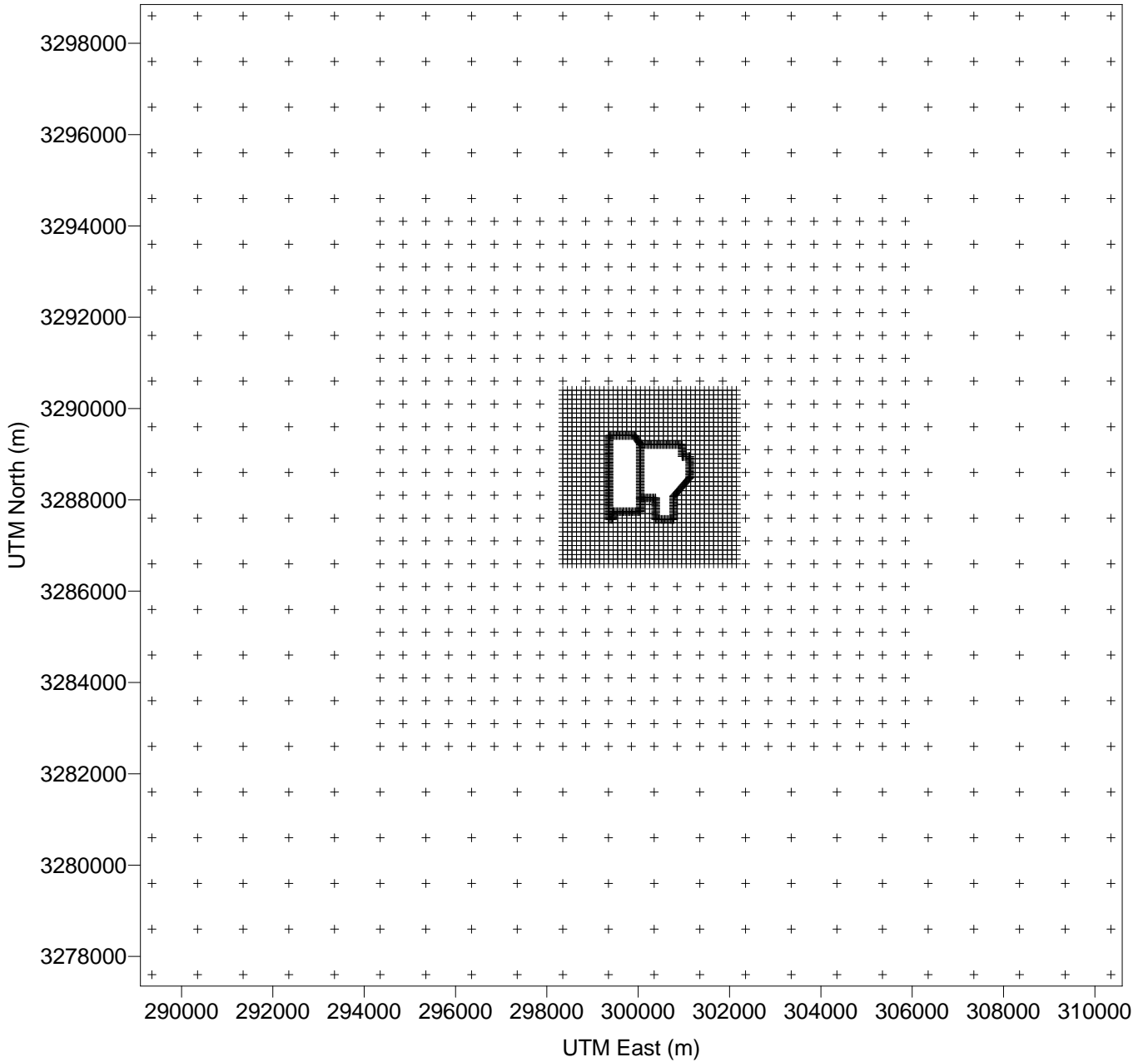
Appendix A provides a summary of structures that were considered in the modeling analysis with their corresponding heights.

9. RECEPTOR GRIDS

The modeled ground-level concentrations are determined within four main Cartesian receptor grids. These four grids cover a region extending at least 10 km beyond the LB-1 sources. The receptor grids are shown in Figure 9-1. The grids are defined as follows:

- The “property line grid” is a discrete receptor grid with the receptors spaced at 25-m intervals along the Equistar property line. The property line grid is at least 300 m away from the sources under consideration. Therefore, a tight grid was not developed.
- The “fine grid” contains 100-m spaced receptors extending at least 1 km from the sources under consideration, excluding the receptors within the property line grid.
- The “medium grid” contains 500-m spaced receptors extending 5 km from the sources under consideration, excluding the receptors within the property line and fine grids.
- The “coarse grid” contains 1-km spaced receptors extending at least 10 km from the sources under consideration, excluding the receptors in the property line, fine, and medium grids.

Figure 9-1. Receptor Location for La Porte Complex



10. METEOROLOGICAL DATA

As recommended by the TCEQ for modeling in Harris County, pre-processed meteorological data files for the year 2012 is based on surface observations taken from Hobby Airport (Surface ID: HOU, NWS station number 12918), and upper air observations were taken from Lake Charles, Louisiana (Upper Air station ID 3937), as obtained from the TCEQ.

According to the EPA AERMOD Users Guide, a land use analysis must be conducted to properly define surface characteristics, such as albedo, Bowen ratio, and surface roughness length, for input into the AERMET meteorological pre-processor. The AERMOD Users Guide provides surface characteristic parameters based on seasons and the following land use characteristics: water (fresh and sea), deciduous forest, coniferous forest, swamp, cultivated land, grassland, urban, and desert shrub land.¹⁰

Pre-processed meteorological files obtained from the TCEQ allow the choice of varying roughness length (i.e., short, medium, and long) based on the land use surrounding the facility under evaluation. The land use surrounding the La Porte Complex is predominantly industrial and residential structures and open water. The typical surface roughness for this type of land use is generally between 0.1 – 0.7 m, which corresponds to the medium surface roughness category.

An analysis performed using the latest version of AERSURFACE (v13016) confirms the appropriate surface roughness data set to be used in the air dispersion modeling analysis. AERSURFACE requires the input of land cover data from U. S. Geological Survey (USGS) National Land Cover Data 1992 archives (NLCD92), which is used to determine the land cover types for the user-specified location.¹¹ There is more recent NLCD than the 1992 data available, but it is not compatible with the current version of AERSURFACE. In this modeling analysis, the NLCD92 data was downloaded from the National Map Viewer and Download Platform through the following website: <http://www.mrlc.gov/viewerjs/>.

An AERSURFACE run using a 1 km radius circle centered at the facility is performed for the annual period. The resulting surface roughness estimate using AERSURFACE is 0.526 m. Per TCEQ guidance, since this value is between 0.1 and 0.7 m, the meteorological data with medium surface characteristics was used in the modeling analysis.¹² The AERSURFACE output file is included in Appendix D.

¹⁰ Section 4.7.7 of the EPA's AERMOD User Guide, Draft Version, January 1999.

¹¹ AERSURFACE User's Guide, EPA-454/B-08-001, January 2008.

¹² <ftp://ftp.tceq.state.tx.us/pub/OPRR/APD/AERMET/AERMETv11103/BackgroundInformation/aermet.pdf>, Date accessed: April 19, 2012.

11. MODELING RESULTS

The following section details the results of the State NAAQS analysis, the State Property Line Analysis, and the State Health Effects Analysis.

11.1. STATE NAAQS ANALYSIS

The maximum modeled ground-level concentrations of criteria pollutants obtained using the approach described in Section 2 are presented below. All impacts are below the corresponding SIL and a Full Impacts Analysis is not triggered.

Table 11-1. State NAAQS Modeling Analysis Results

Pollutant	Averaging Period	UTM East	UTM North	GLC _{max} ^A	Secondary PM _{2.5} ^B	Total Impact	SIL	Less than SIL?
		(m)	(m)	(µg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)	
NO ₂	1-hour	300776.3	3287650.1	3.67	--	--	7.5	Yes
	Annual	299548.4	3289411.6	0.003	--	--	1	Yes
CO	1-hour	300776.3	3287650.1	18.32	--	--	2,000	Yes
	8-hour	300850.0	3287500.0	9.33	--	--	500	Yes
SO ₂	1-hour	300776.3	3287650.1	0.02	--	--	7.8	Yes
	3-hour	299750.0	3287300.0	0.015	--	--	25	Yes
	24-hour	300550.0	3287300.0	0.006	--	--	5	Yes
	Annual	299548.4	3289411.6	0.00006	--	--	1	Yes
PM ₁₀	24-hr	300042.2	3288352.4	2.33	--	--	5	Yes
PM _{2.5}	24-hr	300042.2	3288652.4	1.10	0.009	1.109	1.2	Yes
	Annual	300042.2	3288652.4	0.17	0.0003	0.1703	0.2	Yes

^A Short term impacts listed are the maximum from either LBFLARE or LBFLRMSS, as both scenarios cannot occur at the same time.

^B As calculated in Section 2.1.1.

11.2. STATE PROPERTY LINE ANALYSIS

The maximum modeled ground-level concentrations of SO₂ at and beyond the property line obtained using the approach described in Section 2 are compared with applicable concentration standards and the results are shown below in Table 11-2. The maximum modeled concentration is less than 2% of the State Property Line Standard and no further analysis is required.

Table 11-2. State Property Line Modeling Analysis Results

Pollutant	Averaging Period	UTM East	UTM North	GLC _{max}	State Property Line Standard	GLC _{max} < 2% Standard?
		(m)	(m)	(µg/m ³)	(µg/m ³)	
SO ₂	1-hr	300776.30	3287650.10	0.02	715	Yes

11.3. STATE HEALTH EFFECTS EVALUATION

As described in Section 2.3 of this modeling report, the speciated constituents were evaluated based on the TCEQ MERA guidance. MERA guidance provides an 8-step procedure for impact analysis. Each step leads to more detailed and refined requirements. If a pollutant can pass any one of the 8 steps, it passes the health impact analysis.

The emission rates used in the MERA analysis are based on tables provided in Appendix B. The ESL values were acquired from Texas Air Monitoring Information System (TAMIS) on May 24, 2018. The results of the MERA analysis are provided in Appendix E.

11.3.1. Step 1

Step 1 of the MERA analysis allows pollutants with no net increase to drop out of the analysis. As the LB-1 Unit is being reviewed as a complete project from the time of the initial permit issuance, there are no emission decreases associated with this project and this step does not apply.

11.3.2. Step 2

According to the MERA guidance, if the short-term emission rate of a pollutant meets one of the conditions in Table 11-3 and the long-term ESL of the pollutant is no less than 10% of the short-term ESL, this pollutant passes the MERA analysis. As shown in Appendix E; 1-pentene and mineral spirits pass the health impact analysis at Step 2 and no further review is required for these chemicals.

Table 11-3. MERA Step 2

Short-term ESL, $\mu\text{g}/\text{m}^3$	Short-term Emission Increase, lb/hr
$2 \leq \text{ESL} < 500$	≤ 0.04
$500 \leq \text{ESL} < 3500$	≤ 0.1
$\text{ESL} \geq 3500$	≤ 0.4

11.3.3. Step 3

This step involves determining if the impacts from each pollutant will result in a concentration no greater than 10% of the air toxic's respective ESL. Equistar choose to model the individual sources in AERMOD (using the source parameters described in Section 5.1) for the analysis in Step 3.

According to MERA guidance, a pollutant will fall out at Step 3 if the following equation is true:

$$\sum_{i=1}^n (X_i * ER_i) \leq 0.1 * \text{ESL}$$

The list of pollutants that screen out through Step 3 is presented in Table 11-4.

Table 11-4. Chemicals that Pass MERA at Step 3

Tetrachloroethylene	Isopentane	Lube Oil
Butene	n-Hexane	Ethylene Glycol
Ethylene (annual only)	n-Butane	
Hexene (annual only)	Iso-Hexane	

Only the short-term impacts of ethylene and hexane are not screened out through Step 3.

11.3.4. Steps 4 and 5

Step 4 allows for a review of project impacts and other increases since the last sitewide modeling. Sitewide modeling has not been performed previously for short-term impacts of ethylene or hexene; therefore this step is not utilized. Step 5 addresses only MSS impacts and may not be used in this analysis as there are also production emissions associated with the project.

11.3.5. Step 6

Step 6 applies the ratio test to determine if impacts from the project will be acceptable when compared to total emissions from the site. The MERA analysis is completed as Step 6 if the following equation is true:

$$\frac{GLC_{\max}}{ESL} \leq \frac{ER_p}{ER_s}$$

As documented in Appendix E, short-term impacts of ethylene and hexene pass the ratio test and no further analysis is required for this project.

12. ELECTRONIC FILES

The email included with the modeling report package contains all of the air quality dispersion modeling analysis electronic data files used to generate the results presented in this report. These electronic data files include the following:

- > All AERMOD input, output, and plot data
- > All BPIP-PRIME (i.e. downwash) input and output data files
- > Meteorological Data Files

All the AERMOD and BPIP files for each pollutant, averaging period and scenario will be included in respective .zip or .amz extension folders, both of which are zipped files.

Appendix A: LIST OF BUILDINGS/STRUCTURES CONSIDERED IN MODELING

Table A-1. Circular Buildings

ID	Description	X coordinate	Y coordinate	Elevation	Height	Radius
		Meters	Meters	Meters	Meters	Meters
QE6410F	Pygas Tank	300901.1	3288489.4	6.76	14.63	13.72
QE6402F	Mixed C4 Tank	300888.7	3288406.9	6.52	12.19	8.38
QE6403F	Mixed C4	300922.5	3288406.9	6.51	12.19	8.38
X61AH000		300125.0	3288689.0	5.85	12.19	9.10
QE6404F	Mixed C4 Tank	300891	3288374	6.59	12.19	8.38
QE6405F	Mixed C4 Tank	300925	3288374	6.51	12.19	8.38
FRWTRTK	FIRE WATER TANK	299665.6	3288882.7	8.31	12.19	9.75
VA5521	VAM STORAGE TANK	300605.5	3288879.1	6.1	15.54	16.76
V579SC	AA TANK	300296.8	3288805.6	6.3	11.58	7.62
V578SC	AA TANK	300297.2	3288784.4	6.37	11.58	7.62
V573	VAM TANK	300296.4	3288728.7	5.9	12.19	7.77
V574	VAM TANK	300319.6	3288729.5	6.06	12.19	7.77
V605	VAM TANK	300342.8	3288728.7	6.12	12.19	7.77
V575	VAM TANK	300295.3	3288706.3	6.37	9.75	3.96
V576	VAM TANK	300305.8	3288706.3	6.47	9.75	3.96
V577	VAM TANK	300319.3	3288706.3	6.43	9.75	3.96
V787	VAM TANK	300341.9	3288704.4	6.07	12.19	10.21
V5117	VAM TANK	300372.8	3288704.4	6.03	12.19	10.21
V5118	AA TANK	300350.0	3288818.0	6.17	12.19	10.21
V5129	AA TANK	300371.8	3288784.3	6.18	12.19	10.21
V5238	AA TANK	300353.0	3288541.4	5.97	14.94	15.70
V5251	AA TANK	300303.1	3288526.8	6.09	12.19	5.33
V5315	AA TANK	300303.1	3288550.1	5.96	12.19	5.33
V5312	METHYL ACETATE TANK	300392.6	3288566.4	5.83	14.33	10.21
V5252	AA TANK	300306.9	3288587	6.06	12.19	6.40
V5209	METHANOL TANK	300345.4	3288598.4	6.02	10.06	4.57
V5210	METHANOL TANK	300364.9	3288598.4	6.07	10.06	4.57
V5126		300295.4	3288967.9	7.29	4.57	8.60
QRD78AXG		300281.5	3288415.6	6.17	6.10	3.70
QRD78AXH		300281.2	3288424.5	6.14	6.10	3.60
QRD78AXI		300281.2	3288435.4	6.14	6.10	3.35
QRD78AXJ		300280.5	3288445.3	6.1	6.10	3.35

ID	Description	X coordinate	Y coordinate	Elevation	Height	Radius
		Meters	Meters	Meters	Meters	Meters
QRD78AXK		300295.7	3288415.6	6.49	6.10	3.35
QRD78AXL		300295.7	3288424.9	6.43	6.10	3.35
QRD78AXM		300295.7	3288435.4	6.4	6.10	3.35
QRD78AXN		300295.1	3288446	6.31	6.10	3.35
QRD78AXO		300315.6	3288414.3	6.17	7.62	4.27
QRD78AXP		300315.9	3288427.5	6.13	12.19	4.88
QRD78AXQ		300314.9	3288443	6.03	12.19	4.88
QRD78AXR		300336.7	3288423.2	6.12	15.24	6.10
QRD78AXS		300337	3288442	6.01	15.24	5.49
QRD78AXT		300356.5	3288422.5	6.08	15.24	6.10
QRD78AXU		300356.5	3288441.4	5.98	15.24	6.10
QRD78AXV		300375.7	3288422.5	6.15	15.24	6.10
QRD78AXW		300375.7	3288442.4	6.16	15.24	6.10
QRD78AXX		300395.2	3288422.9	6.17	15.24	6.10
QRD78AXY		300394.8	3288442.4	6.11	15.24	6.10
QRD78AY2		300572.6	3288686.8	5.98	12.19	21.4
QRD78AY3		300595.7	3288728.1	6.08	12.19	11.2
QRD78AY5		300515.1	3288569.2	6.02	12.19	16.5
QRD78AY6		300480.1	3288566.9	6.08	9.14	12.5
QRD78AY8		300521.4	3288435.1	6.2	6.10	8.5
QRD78AY9		300493.9	3288411.3	6.32	6.10	17.5
QRD78AYI		300892.9	3288299.4	6.99	4.88	8.80
QRD78AYJ		300915.6	3288320.3	6.84	7.32	16.3
RLCY1	RL SILO 1	299785.2	3288216.4	7.67	51.82	2.74
RLCY2	RL SILO2	299785.1	3288209.5	7.68	51.82	2.74
RLCY3	RL SILO3	299785.0	3288223.3	7.65	51.82	2.74
RLCY4	RL SILO4	299791.7	3288209.6	7.5	51.82	2.74
RLCY5	RL SILO5	299791.5	3288216.3	7.49	51.82	2.74
RLCY6	RL SILO6	299791.3	3288223.6	7.5	51.82	2.74

Table A-2. Polygon Buildings

ID	Description	X coordinate	Y coordinate	Elevation	Height
		Meters	Meters	Meters	Meters
K13	POLYMER ADMIN BUILDING	299945.9	3289194.2	7.91	6.10
K5342	ACETYLS ADMN BLDG	300089.0	3289007.9	8.02	4.57
K12	FIRE STATION	299629.5	3289191.7	8.27	9.14
K5	WAREHOUSE	299481.3	3289067.1	8.14	9.14
K24	SAFETY OFFICES	299732.4	3289126.2	8.3	4.57
QRD78AYF		300495.7	3288113.5	7.06	18.29

Table A-3. Rectangular Buildings

ID	Description	X coordinate	Y coordinate	Elevation	Height	X length	Y length	Angle
		Meters	Meters	Meters	Meters	Meters	Meters	Degree
9GKX900B		300165.8	3288605.7	6.03	21.34	69.2	19.30	0.0
K3008	WAREHOUSE BUILDING	299461.8	3288548.3	8.36	12.19	48	117	0.0
CNTRLRM	CONTROL ROOM	299618.6	3288430.2	7.66	4.57	12	10	0.0
ELCTRCBD	ELECTRIC BUILDING	299549.2	3288418.7	7.69	15.24	25	21.5	0.0
K906	AB2 WAREHOUSE	299837.0	3288793.8	7.65	12.19	81.2	42.0	0.0
K16	STORES AND MACHINE SHOP	299735.1	3288854.5	8.18	9.14	27.6	158.8	0.0
AGLGO00P		299714.6	3288893.6	8.11	4.57	11.5	20.0	0.0
AGLGO00Q		299716.5	3288820.2	8.02	4.57	9.20	13	0.0
K1	CONTROL ROOM	299585.6	3288965.8	8.07	4.57	27.6	16	0.0
K17	AIS SHOP	299560	3288872	8.71	6.10	15	33	0.0
K8	DRUM STORAGE BUILDING	299527.3	3288852.2	8.72	4.57	30	12	0.0
WELD	WELDING SHOP	300163.0	3288874.5	6.61	6.10	26.5	10.5	0
7501K	OFFICES,SHOP,STORAGE	300565.5	3287920.0	7.94	12.19	95	35	0.0
QQXPH0T1		299462.1	3288523.9	8.32	18.29	30	17.3	0.0
AB2SILOS	AB2 SILO STORAGE SOUTH	299516.7	3288547.9	7.7	18.288	31.0	23	0.0
AB2SILON	AB2 SILO STORAGE NORTH	299513.7	3288613.3	7.68	18.288	33	23	0.0
K3003	COMPRESSOR BUILDING	299602	3288608	7.71	9.144	28	57	0.0

ID	Description	X coordinate	Y coordinate	Elevation	Height	X length	Y length	Angle
		Meters	Meters	Meters	Meters	Meters	Meters	Degree
K3004	COMPRESSOR BUILDING	299601.9	3288516.6	7.72	9.14	25.8	57.30	0.0
K15	LAB	299814.7	3289229.9	8.4	6.10	58.1	17.8	-23.9
K14	HEALTH AND SAFETY BUILDING	299883.5	3289324.5	8.38	6.10	32.0	23.6	-34.2
CTW1	COOLING TOWER 1	299950	3288523	6.87	12.19	42.0	15	0.0
K3007	REPROCESSING BUILDING	299516.6	3288572.6	7.71	21.34	30	40	0.0
K3005	EXTRUDER BUILDING	299561	3288614	7.67	9.14	24	41.0	0.0
K3006	EXTRUDER BUILDING	299562	3288531	7.72	9.14	16	31.0	0.0
K3023	CONTROL ROOM	299696	3288548	7.74	4.57	13	18	0.0
CTWAB3	COOLING TOWER	299696	3288598	7.76	15.24	25	20.0	0.0
K7	MCC BUILDING	299544	3288893	8.8	4.57	15	15	0
QRD78AWI		299849.2	3289295.7	8.24	4.57	19.9	11.4	-26.6
QRD78AWP		299706.7	3288854.9	8	7.62	20.4	28.5	0.0
QRD78AWQ		299661.4	3288569.3	7.77	4.57	13.9	19.8	0.0
QRD78AWR		299667.5	3288607.2	7.78	4.57	7.5	22.0	0.0
QRD78AWS		299540	3288506.9	7.71	4.57	10.7	8.8	0.0
RCTWALL	REACTOR ALL	299577.5	3288442.6	7.65	15.24	53.9	14.8	0.0
QRD78AWU		299551.5	3288446.5	7.68	18.29	22.5	11.8	0.0
QRD78AWV		299689.8	3288353.4	7.77	3.66	18.9	16	0.0
QRD78AWW		299958	3288875	7.54	6.10	20.5	27	0.0
QRD78AWZ		299888.2	3288662.2	6.87	6.10	19.6	18.8	0.0
QRD78AX0		299911.5	3288654.6	7	6.10	15.2	26.5	0.0
QRD78AX1		299974.1	3288632.9	6.8	30.48	25.7	20.0	0.0
QRD78AX2		299944.4	3288656.2	6.88	15.24	13.6	26.8	0.0
QRD78AX5		300005.7	3288391.5	7.58	18.29	18.2	7	0.0
QRD78AX6		300004.4	3288399.4	7.51	30.48	22.8	8.3	0.0
QRD78AX7		300008.4	3288407.7	7.45	18.29	17.5	6	0
QRD78AX8		300008.7	3288415.3	7.44	9.14	15.5	38.8	0.0
QRD78AXA		300203.2	3288864.2	6.24	6.10	38	20.8	0.0
QRD78AXB		300203.6	3288820.9	6.03	6.10	37.3	12.5	0.0
QRD78AXC		300174.2	3288819.3	6.04	6.10	19.5	14.5	0.0
QRD78AXD		300202.9	3288767.1	5.97	15.24	25.5	21.0	0
QRD78AXE		300163.6	3288565.9	5.87	12.19	84.2	27.8	0.0
QRD78AXF		300203.2	3288433.1	6.54	6.10	38.4	23.5	0.0

ID	Description	X coordinate	Y coordinate	Elevation	Height	X length	Y length	Angle
		Meters	Meters	Meters	Meters	Meters	Meters	Degree
QRD78AXZ		300319.2	3288236.2	7.16	6.10	92.8	19.5	0.0
QRD78AY0		300449.7	3288876.1	6.15	6.10	51.2	17.5	0.0
QRD78AY7		300565.3	3288423.9	6.17	9.14	21.5	22.5	0
QRD78AYA		300551.1	3287972.3	8.04	6.10	38.6	41.8	0.0
QRD78AYG		300503.3	3288062.4	7.05	18.29	18.5	44.8	0
QRD78AYH		300588.6	3288069.4	7.05	18.29	45.9	101	0.0
COMPRSS1	Compressors 1	299829	3288672	6.85	3.66	10.0	5.85	0
REACTOR	Reactor	299850	3288600	6.76	65.88	16.4	42.20	0
RLOAD	Rail Loading	299780	3288206	7.46	96.32	16.4	21.10	0
EXTRBLD1	Extrusion Building 1	299847	3288532	7.09	10.97	53.85	69.23	0
EXTRBLD2	Extrusion Building 2	299847	3288532	7.09	27.43	2.44	7.92	0
EXTRBLD3	Extrusion Building 3	299847	3288532	7.09	49.07	3.96	2.44	0
OPSBLD	Field OPS Buliding	299858	3288759	7.24	4.57	17.37	16.76	0
CTRBLD	New Control Building	299742	3289281	8.15	6.10	45.72	24.38	0
SUBSTN	New Sub station	299858	3288486	7.08	4.88	48.07	9.96	0
LB1CT	LB1 Cooling Tower	299903	3288533	6.98	13.72	14.63	38.40	0
JWSYS	Jeacket Water System	299900	3288580	6.89	3.66	15.24	46.63	0

Appendix B: SOURCE PARAMETERS AND EMISSION RATES

Table B-1. Modeled Point Source Parameters – Criteria Pollutants

Emission Points			UTM Coordinates of Emission Points			Stack Height	Stack Exit Data		
Model ID	EPN	Source Description	Zone	East	North		Diameter	Velocity	Temp
				(meters)	(meters)	(ft)			
LBFLARE	LBFLARE	LB-1 Flare	15	299895	3288380	213.25	23.95	65.6168	1831.73
LBFLRMSS	LBFLARE - MSS	LB-1 Flare MSS	15	299895	3288380	213.25	24.67	65.6168	1831.73
LBF807	LBF807	Housekeeping Clean-Up Vacuum System	15	299850	3288550	8	0.0033	0.0033	200
LBF806	LBF806	Additive Feed Vent System	15	299850	3288550	74	0.0033	0.0033	200
LBF816	LBF816	Bulk Additive Silo Filter	15	299820	3288320	144	0.0033	0.0033	70
F30F900A	LB30F900A	30-F-900A Elutriator Vent	15	299801	3288218	18	0.0033	0.0033	122
F30F900B	LB30F900B	30-F-900B Elutriator Vent	15	299801	3288218	18	0.0033	0.0033	122
F30F965	LB30F965	30-F-965 Filter	15	299789	3288218	72	0.0033	0.0033	122
LBBL980	LBBL980	Hopper Blower	15	299810	3288225	12	0.0033	0.0033	100
LBPK810	LBPK810	Pellet Dryer Vent	15	299810	3288225	116.5	0.0033	0.0033	100
LBCTA	LBCT	LB-1 Cooling Tower Fan A	15	299910	3288539.7	45	30	27	90
LBCTB		LB-1 Cooling Tower Fan B	15	299910	3288552.1	45	30	27	90
LBCTC		LB-1 Cooling Tower Fan C	15	299910	3288564	45	30	27	90

Table B-2. Modeled Point Source Parameters – MERA Unit Run

Emission Points			UTM Coordinates of Emission Points			Stack Height	Stack Exit Data		
Model ID	EPN	Source Description	Zone	East	North		Diameter	Velocity	Temp
				(meters)	(meters)	(ft)			
LBFLARE	LBFLARE	LB-1 Flare	15	299895	3288380	213.25	23.95	65.6168	1831.73
LBFLRMSS	LBFLARE - MSS	LB-1 Flare MSS	15	299895	3288380	213.25	24.67	65.6168	1831.73
LBANALYZ	LBANALYZ	LB-1 Analyzers	15	299828	3288608	10	0.06	1	100
LBWW	LBWW	LB-1 Flare Water Drum	15	299895	3288380	119.08	0.13	0.87	75.4

Table B-3. Modeled Area Source Parameters - MERA Unit Run

Emission Point			UTM Coordinates of Emission Points			Fugitive Data		
Model ID	EPN	Source Description	Zone	East	North	Release Height	X Length	Y Length
				(meters)	(meters)	(ft)	(ft)	(ft)
LBFUG	LBFUG	LB-1 Process Fugitives	15	299823	3288360	10	500	1000
LBRVE	LBRVE	Residual VOC Emissions	15	299780	3288205	20	200	1500
LB1RM	MSS-LB1RM	LB-1 Routine Maintenance	15	299823	3288360	10	500	2000
LB1VC	MSS-LB1-VC	LB-1 Vessel Clearing	15	299823	3288360	20	500	2000
LB1VAC	MSS-LB1-VAC	LB-1 Vacuum Trucks	15	299823	3288360	10	500	2000
LB1RMA	MSS-LB1RMA	LB1 MSS - Attachment A	15	299823	3288360	10	500	2000

Table B-4. Modeled Emission Rates for State NAAQS Analysis

Pollutant	EPN	Source Description	Modeled Emission Rate		
			lb/hr	24-hr lb/hr*	tpy
NO _x	LBFLARE	LB-1 Flare	66.34	--	8.79
	LB1FLARE-MSS	LB-1 Flare MSS	73.74	--	6.84
CO	LBFLARE	LB-1 Flare	307.58	--	--
	LB1FLARE-MSS	LB-1 Flare MSS	368.17	--	--
SO ₂	LBFLARE	LB-1 Flare	0.43	--	0.12
	LB1FLARE-MSS	LB-1 Flare MSS	0.42	--	0.21
PM ₁₀	LBF807	Housekeeping Clean-Up Vacuum System	--	0.013	--
	LBF806	Additive Feed Vent System	0.07	--	--
	LBF816	Bulk Additive Silo Filter	--	0.042	--
	LB30F900A	30-F-900A Elutriator Vent	0.14	--	--
	LB30F900B	30-F-900B Elutriator Vent	--	0.093	--
	LB30F965	30-F-965 Filter	0.40	--	--
	LBCT	LB-1 Cooling Tower	0.25	--	--
	LBBL980	Hopper Blower	--	0.07	--
PM _{2.5}	LBPk810	Pellet Dryer Vent	0.17	--	--
	LBF807	Housekeeping Clean-Up Vacuum System	--	0.013	0.06
	LBF806	Additive Feed Vent System	0.07	--	0.30
	LBF816	Bulk Additive Silo Filter	--	0.042	0.02
	LB30F900A	30-F-900A Elutriator Vent	0.04	--	0.11
	LB30F900B	30-F-900B Elutriator Vent	--	0.027	0.11
	LB30F965	30-F-965 Filter	0.10	--	0.41
	LBCT	LB-1 Cooling Tower	0.0008	--	0.003
	LBBL980	Hopper Blower	--	0.015	0.0018
LBPk810	Pellet Dryer Vent	0.17	--	0.75	

*For sources that do not emit continuously for 24 hours, the hourly emission rate was adjusted based on the number of hours per day the source can vent.

LB Flare

	9.76E+08 btu/hr
gross heat release q	68,291,777 cal/s
MW	20.80
net heat release qn	53,342,810
effective stack diameter D (m)	7.30

	Btu/lb		lb/hr to flare	MMBtu/hr
Ethylene	20295	99%	7749.65	157.28
Ethane	20432	99%	2667.69	54.51
Hydrogen	51623	99%	1890.04	97.57
Butanes	19665	98%	346.81	6.82
Butenes	19680	98%	7338.18	144.42
Hexene	19134	98%	966.69	18.50
iso-Hexane	19391	98%	1177.95	22.84
iso-Pentane	19499	98%	1887.68	36.81
Propane	21502	99%	14125.82	303.73
Methane	21520	99%	6186.48	133.13
Nitrogen	n/a	n/a	5563.96	
Methanol	9712	98%	0.04	0.00
Propylene	19688	99%	0.00	0.00
H2S	n/a	n/a	0.00	
COS	n/a	n/a	0.00	
Carbon Mono	n/a	n/a	0.00	
CO2	n/a	n/a	81.72	
C5+	17450	98%	0.56	0.01
Total			49983.28	975.61
Total VOC			33593.39	

LB Flare - MSS

	1.08E+09 btu/hr
gross heat release q	75,912,179 cal/s
MW	28.44
net heat release qn	56,479,052
effective stack diameter D (m)	7.52

	Btu/lb		lb/hr to flare	MMBtu/hr
Ethylene	20295	99%	6825.60	138.53
Ethane	20432	99%	2085.413277	42.61
Hydrogen	51623	99%	648	33.45
Butanes	19665	98%	345.6	6.80
Butenes	19680	98%	2376	46.76
Hexene	19134	98%	1188	22.73
iso-Hexane	19391	98%	0	0.00
iso-Pentane	19499	98%	691.2	13.48
Propane	21502	99%	27811.91232	598.01
Methane	21520	99%	6696	144.10
Nitrogen	n/a	n/a	1,931.70	
Methanol	9712	98%	-	0.00
Propylene	19688	99%	16.51066065	0.33
H2S	n/a	n/a	0	
COS	n/a	n/a	0	
Carbon Mono	n/a	n/a	0	
CO2	n/a	n/a	80.951	
C5+	17450	98%	2160	37.69
Total			52856.89	1084.48
Total VOC			41414.82	

Appendix C: PLOT PLAN

Appendix D: AERSURFACE OUTPUT

```
** Generated by AERSURFACE, dated 08009
** Center UTM Easting (meters): 300164.0
** Center UTM Northing (meters): 3288566.0
** UTM Zone: 15 Datum: NAD83
** Study radius (km) for surface roughness: 1.0
** Airport? N, Continuous snow cover? N
** Surface moisture? Average, Arid region? N
** Month/Season assignments? Default
** Late autumn after frost and harvest, or winter with no snow: 12 1 2
** Winter with continuous snow on the ground: 0
** Transitional spring (partial green coverage, short annuals): 3 4 5
** Midsummer with lush vegetation: 6 7 8
** Autumn with unharvested cropland: 9 10 11
**
FREQ_SECT ANNUAL 1
SECTOR 1 0 360
**      Sect Alb  Bo  Zo
SITE_CHAR 1  1  0.16  0.58  0.526
```


Appendix E: MERA ANALYSIS RESULTS

Table E-1. State Health Effects Evaluation (MERA Analysis)

Chemical Compound	CAS No.	TCEQ ESL ¹		Total Project Increases		Step 2					
		Short-term (µg/m ³)	Long-term (µg/m ³)			LT ESL ≥ 10% ST ESL? (Yes/No)	Step 2 De Minimis Levels	Level 1	Level 2	Level 3	De Minimis Increase? (Yes/ No)
								Is Increase ≤ 0.04 lb/hr and 2 ≤ ST ESL	Is Increase ≤ 0.1 lb/hr and 500 ≤ ST	Is Increase ≤ 0.4 lb/hr and ST ESL ≥	
Tetrachloroethylene	127-18-4	2,000	26	1.26	0.04	No, Continue to Step 3	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Butene	106-98-9	19,000	1,600	148.82	9.45	No, Continue to Step 3	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Ethylene	74-85-1	1,400	34	83.93	15.25	No, Continue to Step 3	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Hexene	592-41-6	1,700	170	77.35	22.03	Yes	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Isopentane	78-78-4	59,000	7,100	37.76	3.10	Yes	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Propane	74-98-6	Simple Asphyxiant	Simple Asphyxiant	322.20	18.47	--	--	--	--	--	--
n-Hexane	110-54-3	5,600	200	0.01	0.01	No, Continue to Step 3	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
1-Pentene	109-67-1	290	480	3.09E-05	2.85E-05	Yes	1	Yes	--	--	Yes, Compliance with Step 2
n-Butane	106-97-8	66,000	7,100	7.11	14.72	Yes	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
iso-Hexane	107-83-5	5,600	200	24.79	4.19	No, Continue to Step 3	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Mineral Spirits	64475-85-0	3,500	350	0.34	8.73E-04	Yes	3	--	--	Yes	Yes, Compliance with Step 2
Propylene	115-07-1	Simple Asphyxiant	Simple Asphyxiant	0.22	3.40E-03	--	--	--	--	--	--
Lube Oil		1,000	100	0.18	0.81	Yes	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3
Ethylene Glycol	107-21-1	450	4.5	0.02	0.09	No, Continue to Step 3	N/A, Continue to Step 3	--	--	--	N/A, Continue to Step 3

¹ Short- and Long-term Effects Screening Levels (ESLs) from the TCEQ Texas Air Monitoring Information System (TAMIS) retrieved on May 24, 2018.

² Per AERMOD unit run model results included with this MERA Analysis.

Table E-2. Step 3 Unit Emission Rate Impacts

EPN	Model ID	1-hr	Annual
LBFUG	LBFUG	77.13755	2.43942
LBRVE	LBRVE	35.45128	0.89793
LBFLARE	LBFLARE	0.05079	0.00077
LBFLARE MSS	LBFLRMSS	0.04977	0.00071
LBWW	LBWW	15.45335	0.16643
LBANALYZ	LBANALYZ	107.6224	1.24598
MSS-LB1RM	LB1RM	42.77669	1.70035
MSS-LB1RMA	LB1RMA	42.77669	1.70035
MSS-LB1-VAC	LB1VAC	42.77669	1.70035
MSS-LB1-VC	LB1-VC	41.72342	1.64087

From AERMOD Unit Run

Table E-3. Step 3 Short Term Impacts

EPN	Ei (lb/hr)													Xi*Ei															
	Tetrachloroethylene	Butene	Ethylene	Hexene	Isopentane	Propane	n-Hexane	1-Pentene	n-Butane	iso-Hexane	Mineral Spirits	Propylene	Lube Oil	Ethylene Glycol	Tetrachloroethylene	Butene	Ethylene	Hexene	Isopentane	Propane	n-Hexane	1-Pentene	n-Butane	iso-Hexane	Mineral Spirits	Propylene	Lube Oil	Ethylene Glycol	
LBFUG	0	0.14	0.94	0.21	0	0.77	0	0	0	0	0	0	0.18	0.02	--	10.799	72.509	16.199	--	59.396	--	--	--	--	--	--	--	13.885	1.543
LBRVE	0	0.23	0.02	7.39	0	0.23	0	0	0.14	1.22	0	0	0	0	--	8.154	0.709	261.985	--	8.154	--	--	4.963	43.251	--	--	--	--	--
LBFLARE	0	146.76	77.5	19.34	37.75	141.26	0	0	6.94	23.56	0	0	0	0	--	7.454	3.936	0.982	1.917	7.175	--	--	0.352	1.197	--	--	--	--	--
LBFLARE MSS	0	47.52	68.26	66.96	13.82	278.12	0	0	6.91	0	0	0.17	0	0	--	2.365	3.397	3.333	0.688	13.842	--	--	0.344	--	--	0.008	--	--	
LBWW	0	0.22	0.19	0.05	0.01	0.04	0	0	0	0.01	0	0	0	0	--	3.400	2.936	0.773	0.155	0.618	--	--	--	0.155	--	--	--	--	--
LBANALYZ	0	0	3.09E-05	7.72E-05	0	1.54E-05	0.013	3.09E-05	0.0015	0	0	0	0	0	--	--	0.003	0.008	--	0.002	1.446	0.003	0.166	--	--	--	--	--	--
MSS-LB1RM	0	0.195	0.391	0.835	0	0.870	0	0	0	0	0.339	0	0	0	--	8.330	16.741	35.716	--	37.207	--	--	--	--	14.510	--	--	--	--
MSS-LB1RMA	1.26	0	0	0	0	0	0	0	0	0	0	0	0	0	53.899	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MSS-LB1-VAC	0	0	0	1.658	0	0	0	0	0	0	0	0	0	0	--	--	--	70.916	--	--	--	--	--	--	--	--	--	--	--
MSS-LB1-VC	0	1.28	4.89	0.25	0	42.17	0	0	0.03	0	0	0.05	0	0	--	53.406	204.028	10.431	--	1759.477	--	--	1.252	--	--	2.086	--	--	
														Total	53.899	93.907	304.259	400.342	2.760	1885.870	1.446	0.003	7.077	44.602	14.510	2.095	13.885	1.543	
														Normal	0	29.807	80.094	279.947	2.072	75.344	1.446	0.003	5.482	44.602	0	0	13.885	1.543	
														MSS	53.899	64.101	224.165	120.395	0.688	1810.525	0	0	1.596	0	14.510	2.095	0	0	

Table E-4. Step 3 Long Term Impacts

EPN	Ei (lb/hr)													Xi*Ei															
	Tetrachloroethylene	Butene	Ethylene	Hexene	Isopentane	Propane	n-Hexane	1-Pentene	n-Butane	iso-Hexane	Mineral Spirits	Propylene	Lube Oil	Ethylene Glycol	Tetrachloroethylene	Butene	Ethylene	Hexene	Isopentane	Propane	n-Hexane	1-Pentene	n-Butane	iso-Hexane	Mineral Spirits	Propylene	Lube Oil	Ethylene Glycol	
LBFUG	0	0.139	0.936	0.210	0	0.769	0	0	0	0	0	0	0.185	0.021	--	0.340	2.283	0.512	--	1.877	--	--	--	--	--	--	--	0.451	0.050
LBRVE	0	0.116	0.009	3.699	0	0.116	0	0	0.068	0.616	0	0	--	--	--	0.105	0.008	3.321	--	0.105	--	--	0.062	0.554	--	--	--	--	--
LBFLARE	0	1.023	1.285	0.443	0.594	2.256	0	0	3.224	0.338	0	0	--	--	--	0.001	0.001	0.0003	0.0005	0.002	--	--	0.002	0.0003	--	--	--	--	--
LBFLARE MSS	0	0.840	1.210	0.630	0.112	0.998	0	0	0.068	0	0	6.85E-04	--	--	--	0.001	0.001	0.0004	0.0001	0.001	--	--	0.00005	--	--	0.0000005	--	--	
LBWW	0	0.037	0.032	0.009	0.002	0.007	0	0	0	0.002	0	0	--	--	--	0.006	0.005	0.002	0.0004	0.001	--	--	--	0.0004	--	--	--	--	--
LBANALYZ	0	0	6.50E-06	1.63E-05	0	3.25E-06	0.003	6.50E-06	0.0003	0	0	0	--	--	--	--	0.00001	0.00002	--	0.000004	0.004	0.00001	0.0004	--	--	--	--	--	--
MSS-LB1RM	0	1.43E-04	2.87E-04	4.09E-04	0	0.001	0	0	0	0	1.99E-04	0	--	--	--	0.0002	0.0005	0.001	--	0.001	--	--	--	--	0.0003	--	--	--	--
MSS-LB1RMA	0.009	0	0	0	0	0	0	0	0	0	0	0	--	0.016	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MSS-LB1-VAC	0	0	0	0.037	0	0	0	0	0	0	0	0	--	--	--	--	0.063	--	--	--	--	--	--	--	--	--	--	--	--
MSS-LB1-VC	0	0.002	0.009	0.000	0	0.071	0	0	4.6E-05	0	0	9.13E-05	--	--	--	0.004	0.015	0.001	--	0.116	--	--	0.000	--	--	0.0001	--	--	
														Total	0.016	0.456	2.314	3.900	0.001	2.102	0.004	0.00001	0.065	0.554	0.0003	0.0002	0.451	0.050	

APPENDIX E: PLOT PLAN

APPENDIX F: PROCESS FLOW DIAGRAM

APPENDIX G: DETAILED EMISSIONS CALCULATIONS
