RPS JDC

14450 JFK Blvd., Suite 400, Houston, TX 77032
Tel: (713) 330 8500 Fax: (281) 987 3500
Internet: www.rpsgroup.com/energy

May 19, 2008

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

Re: New Source Review Air Quality Permit Application:
Las Brisas Energy Center, LLC
Circulating Fluidized-Bed (CFB) Steam Electric Generation Facility
Corpus Christi, Nueces County

Dear Mr. Hyde:

On behalf of Las Brisas Energy Center, LLC (LBEC), RPS JDC, Inc. (RPS JDC) is submitting the enclosed permit application for the construction of a circulating fluidized-bed (CFB) steam electric generating facility in Corpus Christi, Nueces County. The facility will consist of four petroleum coke fired CFB steam electric generating units or boilers that will produce electricity.

The facility will use the best available control technology (BACT) to reduce emissions including limestone injection directly into the boilers to reduce sulfur dioxide emissions, selective non-catalytic reduction (SNCR) to reduce nitrogen oxide emissions, a polishing scrubber to further reduce acid gas emissions, and finally a fabric filter to reduce particulate and metals emissions.

The proposed facility is a major source for all of the criteria pollutants emitted from the facility; therefore, a Prevention of Significant Deterioration (PSD) permit is required. The complete PSD analysis will be included in an air quality analysis. The air quality analysis will be submitted after TCEQ reviews and approves the proposed emission rates. A permit application fee of $75,000 has been submitted to the TCEQ Financial Administration Division.

We wish to thank you in advance for you consideration of this application. If you have any questions, please feel free to contact me at (832) 239-8019 or Mr. John Upchurch of LBEC at (281) 636-2017.

Sincerely,

RPS JDC, Inc.

Shanon G. DiSorbo, P.E.
Vice President

STATE OF TEXAS
SHANON G. DISORBO
97020
LICENSED
PROFESSIONAL ENGINEER

SGD/tc

Enclosure

cc: Mr. David Turner, Air Section Manager, TCEQ Region 14
Mr. Jeff Robinson, Air Permits Section (6PD-R), EPA Region 6
Mr. John Upchurch, Managing Partner, Las Brisas Energy Center, LLC

bc: Ms. Kathleen Smith, Managing Partner, Las Brisas Energy Center, LLC
Mr. John Riley, Partner, Vinson & Elkins, Austin
Mr. Neal Nygaard, Manager, Houston Office, RPS JDC, Inc.
Mr. Joe Kupper, P.E., Senior Consulting Engineer, RPS JDC, Inc.
Mr. Jarrett Cantrell, Business Development Mgr., Bechtel Power Corporation, Frederick, MD
Mr. Tom Jarobe, Project Director, Bechtel Power Corporation, Frederick, MD
Mr. Don Koza, Project Engineer, Bechtel Power Corporation, Frederick, MD

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Application for Texas Commission on Environmental Quality New Source Review Air Quality Permit

Las Brisas Energy Center, LLC
Corpus Christi, Nueces County, TX

May 2008

STATE OF TEXAS
SHANON G. DISORBO
97020
LICENSED
PROFESSIONAL ENGINEER

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Section 1
Introduction

Las Brisas Energy Center, LLC (LBEC) proposes to construct and operate a new circulating fluidized-bed (CFB) steam electric generation facility on the Joe Fulton Corridor bordering the west side of the Port of Corpus Christi Bulk Terminal in Corpus Christi, Nueces County, Texas. The facility, with the nominal capable of generating 1,200 megawatts, will consist of four petroleum coke-fired CFB steam electric generating units or boilers that will produce electricity to be added the existing regional grid. The facility will use best available control technology (BACT) to reduce emissions including limestone injection directly into the boilers to reduce sulfur dioxide emissions, selective non-catalytic reduction (SNCR) to reduce nitrogen oxide emissions, a polishing scrubber to further reduce acid gas emissions, and finally a fabric filter to reduce particulate and metals emissions.

1.1 Purpose of this Application

This document constitutes the TCEQ permit application for the proposed electric generation facility which includes: four CFB boilers, two auxiliary boilers, two propane vaporizers, thirteen atmospheric storage tanks, anhydrous ammonia pressure storage tanks, two cooling towers, two diesel-fired emergency generators, one diesel-fired fire water pump, four diesel-fired fire water booster pumps, four diesel-fired boiler feed water pumps, piping component fugitives, and the equipment associated with material handling operations for petroleum coke, limestone, lime, sand, water treatment, activated carbon, and ash disposal. The application contains the required emissions information and all additional supporting information and forms required for application review.

The proposed facility will be a new major source as defined by the federal Prevention of Significant Deterioration (PSD) regulations and will emit nitrogen oxides (NO_x), volatile organic compounds (VOC), particulate matter (PM), particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), and sulfuric acid (H_2SO_4), in quantities that trigger PSD review for these pollutants. It should be noted that for purposes of this application, PM_{10} is being considered a surrogate for $PM_{2.5}$ emissions. LBEC is also requesting that a Federal Plant-wide Applicability Limit (PAL) be established for each pollutant regulated under the PSD program.

The facility will be a major source for Title V purposes and a federal operating permit application will be submitted prior to operation as specified by 30 TAC§122.130(c)(1). In addition, because the facility will be subject to the Acid Rain Program established under Title IV of the 1990 Federal Clean Air Act Amendments, LBEC will be required to obtain an Acid Rain Permit. As such, LBEC will submit the required Acid Rain Permit application no later than 24 months before the facility begins operation.

1.2 Application Organization

This application is organized into the following sections:

Section 1 presents the application objectives and organization.

Section 2 contains TCEQ administrative Form PI-1 and CORE Data From.

Section 3 contains an Area Map showing the facility location and a Plot Plan showing the location of the facilities referenced in this submittal.

Section 4 contains a process description for proposed facility.

Section 5 contains a discussion of the estimated emissions from the sources included in this application as well as Table 1(a).

Section 6 presents the BACT analysis for the emissions sources included in this application.

Section 7 contains a discussion of the PAL emissions cap calculation methodology.

Section 8 contains information on the permit application fee, Table 30, and a copy of the fee check.

Section 9 addresses the Prevention of Significant Deterioration (PSD) review. Air quality impacts are addressed briefly in this section; however, the complete air quality analysis will be performed and submitted in a separate document after the TCEQ has approved the proposed emission rates.

Section 10 presents the General Application Requirements that address the applicability of state and federal air regulations to the proposed application.

Section 11 presents the Disaster Review.

Appendix A contains emission calculation details.

Appendix B contains a Table 2, Material Balance.

Appendix C contains TCEQ equipment tables.

Section 2
Administrative Forms

This section contains the following TCEQ forms:

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

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

Update: The TCEQ **requires** that a Core Data Form be submitted on all incoming applications unless a Regulated Entity and Customer Reference Number have been issued by the TCEQ and no core data information has changed. For more information regarding the Core Data Form, call (512) 239-5175 or go to the TCEQ Web site at www.tceq.state.tx.us/permitting/central_registry/guidance.html.

I. APPLICANT INFORMATION			
A. Company or Other Legal Name: Las Brisas Energy Center, LLC			
Texas Secretary of State Charter/Registration Number (*if applicable*):			
B. Company Official Contact Name: Mr. John Upchurch			
Title: Managing Partner			
Mailing Address: 11011 Richmond Ave., Suite 350			
City: Houston	State: TX		Zip Code: 77042
Telephone No: 281-636-2017	Fax No.:	E-mail Address: johnupchurch@lasbrisasenergy.com	
C. Technical Contact Name: Mr. Shanon DiSorbo			
Title: Vice President			
Company Name: RPS JDC, Inc.			
Mailing Address: 14450 JFK Blvd., Suite 400			
City: Houston	State: TX		Zip Code: 77032
Telephone No.: 832-239-8019	Fax No.: 281-987-3500	E-mail Address: disorbos@rpsgroup.com	
D. Facility Location Information:			
Street Address: on the Joe Fulton Corridor bordering the west side of the Port of Corpus Christi Bulk Terminal			
If no street address, provide clear driving directions to the site in writing:			
City: Corpus Christi	County: Nueces		Zip Code: 78409
E. TCEQ Account Identification Number (leave blank if new site or facility):			
F. Is a TCEQ Core Data Form (TCEQ Form No. 10400) attached?			☒ YES ☐ NO
G. TCEQ Customer Reference Number *(leave blank if unknown):*			
H. TCEQ Regulated Entity Number *(leave blank if unknown)*:			
II. IMPORTANT GENERAL INFORMATION			
A. Is confidential information submitted with this application?			☐ YES ☒ NO
If “YES,” is each “confidential” page marked “**CONFIDENTIAL**” in large red letters?			☐ YES ☐ NO

II. IMPORTANT GENERAL INFORMATION (*continued*)		
B. Is this application in response to a TCEQ investigation or enforcement action? If "YES", attach a copy of any correspondence from the TCEQ		☐ YES ☒ NO
C. Number of New Jobs: 70-85		
D. Names of the State Senator and district number for this facility site: Senator Juan 'Chuy' Hinojosa, District 20		
Names of State Representative and district number for this facility site: Representative Abel Herrero, District 34		
E. For Concrete Batch Plants, name of the County Judge for this facility site:		
Mailing Address:		
City:	State:	Zip Code:
F. For Concrete Batch Plants, is the facility located in a municipality or an extraterritorial jurisdiction of a municipality? If "YES," list the name(s) of the Presiding Officer(s) for this facility site:		☐ YES ☐ NO
Mailing Address:		
City:	State:	Zip Code:
III. FACILITY AND SOURCE INFORMATION		
A. Site Name: Las Brisas Energy Center, LLC		
B. Area Name/Type of Facility: Las Brisas Energy Center, LLC		☒ Permanent ☐ Portable
C. Principal Company Product or Business: Electric Power Generation		
Principal Standard Industrial Classification Code: 4939		
D. Projected Start of Construction Date: June 2009	Projected Start of Operation Date: November 2012	
IV. TYPE OF PERMIT ACTION REQUESTED		
A. Permit Number *(if existing)*:		
B. Is this an initial permit application?		☒ YES ☐ NO
If "YES," check the type of permit requested *(check all that apply):* ☒ State Permit ☐ Nonattainment Federal Permit ☐ Flexible Permit ☒ Prevention of Significant Deterioration Federal Permit ☐ Multiple Plant Permit ☒ Hazardous Air Pollutants Permit Federal Clean Air Act § 112(g) Other: PAL		

IV. TYPE OF PERMIT ACTION REQUESTED *(continued)*	
C. Is this a permit amendment? If "YES," check the type of permit requested *(check all that apply):* ☐ State Permit Amendment ☐ Flexible Permit Amendment ☐ Multiple Plant Permit Amendment ☐ Nonattainment Major Modification ☐ Prevention of Significant Deterioration Major Modification ☐ Hazardous Air Pollutants Permit Federal Clean Air Act § 112(g) Modification Other:_____________________________________	☐ YES ☒ NO
D. Is a permit renewal application being submitted in conjunction with this amendment in accordance with Senate Bill 1673? [THSC 382.055(a)(2)](80th Legislative)	☐ YES ☒ NO
E. Is this application for a change in location of previously permitted facilities?	☐YES ☒ NO
If "YES," answer E. 1. and E. 2.	
1. Current location of facility:	
Street Address *(If no street address, provide clear driving directions to the site in writing.)*:	
City: | County: | Zip Code:	
2. Will the proposed facility, site, and plot plan meet all current technical requirements of the permit special conditions? If "NO," attach detailed information.	☐ YES ☐ NO
F. Are there any standard permits, exemptions or permits by rule to be consolidated into this permit?	☐ YES ☒ NO
G. Are you permitting a facility or group of facilities that have planned maintenance, startup and shutdown emissions that cannot be authorized by a permit by rule or standard permit or that are authorized by a permit by rule or standard permit and are being rolled into this permit? If "YES," attach information on any changes to emissions under this application as specified in Section VIII. and Section IXX.	☒ YES ☐ NO
If "YES," answer G. 1 through G. 3.	
1. Are the activities to be included in this permit covered by any previously existing MSS authorizations? If "YES," provide a listing of all other authorizations (permit by rule or standard permit and the associated registration number if any).	☐ YES ☒ NO
2. Have the emissions been previously submitted as part of an emissions inventory?	☐ YES ☒ NO
3. List which years the MSS activities were included in emissions inventory submittals:	

IV. TYPE OF PERMIT ACTION REQUESTED *(continued)*	
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) Is this facility located at a site required to obtain a federal operating permit under 30 TAC Chapter 122?	☒ YES ☐ NO ☐ To be Determined
1. Identify the requirements of 30 TAC Chapter 122 that will be triggered if this PI-1 application is approved. ☐ FOP Significant Revision ☐ FOP Minor ☐ Application for an FOP Revision ☐ Operational Flexibility/Off-Permit Notification ☐ Streamlined Revision for GOP ☒ To be determined ☐ None	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site (check all that apply)	
☐ SOP ☐ GOP ☐ GOP application/revision application: submitted or under APD review – A Title V application will be submitted at a later date.	
☐ SOP application/revision application: submitted or under APD review ☒ N/A	
V. PERMIT FEE INFORMATION	
A. Fee paid for this application:	$75,000
1. Is a copy of the check or money order attached to the original submittal of this application?	☒ YES ☐ NO ☐ N/A
2. Is a Table 30 entitled, “Certification of estimated Capital Cost and Fee Verification,” attached?	☒ YES ☐ NO
VI. PUBLIC NOTICE APPLICABILITY	
A. Is this a new permit application?	☒ YES ☐ NO
B. Is this an application for a major modification of a PSD, NA or 30 TAC § 112(g) permit?	☐ YES ☒ NO
C. Is this a state permit amendment application?	☐ YES ☒ NO
If “YES,” answer C. 1. through C. 3.	
1. Is there any change in character of emissions in this application?	☐ YES ☐ NO
Is there a new air contaminant in this application?	☐ YES ☐ NO
2. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☐ NO
3. List the total annual emission increases associated with the application (*list <u>all</u> that apply*): Volatile Organic Compounds (VOC):________ tpy Particulate Matter (PM):________ tpy Sulfur Dioxide (SO_2):________ tpy Lead (Pb):________ tpy Carbon Monoxide (CO):________ tpy Nitrogen oxides (NO_x):________ tpy Other air contaminants not listed above:________ tpy List:________ tpy	

VI. PUBLIC NOTICE APPLICABILITY *(continued)*			
D. Is this a change of location application?			☐ YES ☒ NO
If "YES," answer D. 1. through D. 3.			
1. Is the new facility site located in or contiguous to the right-of-way of a public works project?			☐ YES ☐ NO
2. Is there a permitted facility occupying the new site? If "YES," please list the permit number:			☐ YES ☐ NO
3. Have portable facilities occupied the new site at any time in the last two years?			☐ YES ☐ NO

VII. PUBLIC NOTICE INFORMATION *(complete if applicable)*		
A. Responsible Person:		
Name: Mr. John Upchurch	Title: Managing Partner	
Mailing Address: 11011 Richmond Ave., Suite 350		
City: Houston	State: TX	Zip Code: 77042
Telephone No.: 281-636-2017	Fax No.:	E-mail Address: johnupchurch@lasbrisasenergy.com
B. Technical Contact: Mr. Shanon DiSorbo		
Company Name:		
Name: RPS JDC, Inc.	Title: Vice President	
Mailing Address: 14450 JFK Blvd.		
City: Houston	State: TX	Zip Code: 77032
Telephone No.: 832-239-8019	Fax No.: 281-987-3500	E-mail Address: disorbos@rpsgroup.com
C. Application in Public Place:		
Name of Public Place: Corpus Christi Central Library		
Physical Address: 805 Comanche St.	City: Corpus Christi	County: Nueces

The public place has granted authorization to place the application for public viewing and copying?	☒ YES ☐ NO
D. Is a bilingual program **required** by the Texas Education Code in the School District?	☒ YES ☐ NO
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	☒ YES ☐ NO
If yes, which language is **required** by the bilingual program? Spanish	☐ YES ☐ NO

VIII. SMALL BUSINESS CLASSIFICATION *(required)*	
A. Does this company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	☒ YES ☐ NO
B. Is the site a major source under 30 TAC Chapter 122, Federal Operating Permit Program?	☒ YES ☐ NO
C. Are the site emissions of any individual air contaminant greater than 50 tpy?	☒ YES ☐ NO
D. Are the site emissions of all air contaminants combined greater than 75 tpy?	☒ YES ☐ NO
IX. TECHNICAL INFORMATION	
A. Is a current area map attached?	☒ YES ☐ NO
Are any schools located within 3,000 feet of this facility?	☐ YES ☒ NO
B. Is a plot plan of the plant property attached?	☒ YES ☐ NO
C. Is a process flow diagram and a process description attached?	☒ YES ☐ NO
D. Maximum Operating Schedule: 24 Hours/Day 7 Days/Week 52 Weeks/Year	
Seasonal Operation? If "YES," please describe	☐ YES ☒ NO
E. Are worst-case emissions data and calculations attached?	☒ YES ☐ NO
1. Is a Table 1(a) entitled, "Emission Point Summary Table," attached?	☒ YES ☐ NO
2. Is a Table 2 entitled, "Material Balance Table," attached?	☒ YES ☐ NO
3. Are equipment, process, or control device tables attached?	☒ YES ☐ NO
F. Are actual emissions for the last two years (determination federal applicability) attached?	☐ YES ☒ NO
X. STATE REGULATORY REQUIREMENTS *Applicants must be in compliance with all applicable state regulations to obtain a permit or amendment.*	
A. The emissions from the proposed facility will comply with all rules and regulations of the TCEQ and details are attached?	☒ YES ☐ NO
B. The proposed facility will be able to measure emissions of significant air contaminants and details are attached?	☒ YES ☐ NO
C. A demonstration of Best Available Control Technology (BACT) is attached?	☒ YES ☐ NO
D. The proposed facilities will achieve the performance in the permit application and compliance demonstration or record keeping information is attached?	☒ YES ☐ NO
E. Is atmospheric dispersion modeling attached?	☐ YES ☒ NO

X. STATE REGULATORY REQUIREMENTS *(continued)* *Applicants must be in compliance with all applicable state regulations to obtain a permit or amendment.*	
F. Does this application involve any air contaminants for which a "disaster review" is required? If "YES," details must be attached.	☒ YES ☐ NO
Note: For a list of air contaminants for which a "disaster review" will be required, refer to the NSRPD Disaster Review Guidance Document at www.tceq.state.tx.us/permitting/air/rules/federal/63/63hmpg.html.	
G. Is this facility or group of facilities located at a site within the Houston/Galveston nonattainment area? (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, or Waller Counties)	☐ YES ☒ NO
1. Does the facility or group of facilities located at this site have an uncontrolled design capacity to emit 10 tpy or more of NO_X?	☒ YES ☐ NO
2. Is this site subject to 30 TAC Chapter 101, Subchapter H, Division 3 (Mass Emissions Cap and Trade)?	☐ YES ☒ NO
3. Does this action make the site subject to 30 TAC Chapter 101, Subchapter H, Division 3 (Mass Emissions Cap and Trade)?	☐ YES ☒ NO
4. Does this action require the site to obtain additional emission allowances?	☐ YES ☒ NO
XI. FEDERAL REGULATORY REQUIREMENTS **Applicants must be in compliance with all applicable federal regulations to obtain a permit or amendment. *If any of the following questions is answered "YES, the application must contain detailed attachments addressing applicability, identify federal regulation Subparts, show how requirements are met, and include compliance information.***	
A. Does a Title 40 Code of Federal Regulations Part 60, (40 CFR Part 60) New Source Performance Standard (NSPS) apply to a facility in this application?	☒ YES ☐ NO
B. Does 40 CFR Part 61, National Emissions Standard for Hazardous Air Pollutants (NESHAP) apply to a facility in this application?	☒ YES ☐ NO
C. Does a 40 CFR Part 63, Maximum Achievable Control Technology (MACT) standard apply to a facility in this application? ***LBEC reserves the right to evaluate further.***	☐ YES ☒ NO
D. Does nonattainment permitting requirements apply to this application?	☐ YES ☒ NO
E. Does prevention of significant deterioration permitting requirements apply to this application?	☒ YES ☐ NO
F. Does Hazardous Air Pollutant Major Source [FCAA § 112(g)] requirements apply to this application? ***LBEC reserves the right to evaluate further.***	☒ YES ☐ NO
XII. COPIES OF THIS APPLICATION	
A. Has the required fee been sent separately with a copy of this Form PI-1 to the TCEQ Revenue Section? *(MC 214, P.O. Box 13088, Austin, Texas 78711).*	☒ YES ☐ NO ☐ NA
B. Are the Core Data Form, Form PI-1, and all attachments being sent to the TCEQ in Austin?	☒ YES ☐ NO
OPTIONAL: Has an extra copy of the Core Data Form, Form PI-1 and all attachments been sent to the TCEQ in Austin? If "YES," please mark this application as "COPY."	☐ YES ☒ NO

XII. COPIES OF THIS APPLICATION *(continued)*	
C. Is a copy of the Core Data Form, the Form PI-1, and all attachments being sent to the appropriate TCEQ regional office	☒ YES ☐ NO
D. Is a copy of the Core Data Form, the Form PI-1, and all attachments being sent to each appropriate local air pollution control program(s)?	☐ YES ☒ NO
List all local air pollution control program(s):	
E. Is a copy of the Core Data Form, Form PI-1, and all attachments (without confidential information) being sent to the EPA Region 6 office in Dallas, Texas? (federal applications only)	☒ YES ☐ NO
F. This facility is located within 100 kilometers of the Rio Grande River and a copy of the application was sent to the International Boundary Water Commission (IBWC):	☐ YES ☒ NO
G. This facility is located within 100 kilometers of a federally-designated Class I area and a copy of the application was sent to the appropriate Federal Land Manager:	☐ YES ☒ NO

XIII. PROFESSIONAL ENGINEER (P.E.) SEAL

Is the estimated capital cost of the project greater than $2 million dollars? If "YES," the application must be submitted under the seal of a Texas licensed Professional Engineer (P.E.).	☒ YES ☐ NO

XIV. DELINQUENT FEES AND PENALTIES

Notice: 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: www.tceq.state.tx.us/agency/delin/index.html.

XV. SIGNATURE

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. I further state that I have read and understand TWC §§ 7.177-7.183, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making or causing to be made false material statements or representations in this application, and TWC § 7.187, pertaining to CRIMINAL PENALTIES.

NAME: John Urchurch SIGNATURE: [signature] DATE: 5/14/2008

Original Signature Required

TCEQ Core Data Form

TCEQ | TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided)*

☒ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)*

☒ Yes ☐ No — Prevention of Significant Deterioration Permit Application

3. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	4. Regulated Entity Reference Number *(if issued)*
CN		RN

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy) 5/16/2008

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other: ____________

7. General Customer Information

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State) ☐ No Change**

*****If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.***

8. Type of Customer:	☒ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☐ Other:

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)*	*If new Customer, enter previous Customer below*	*End Date:*
Las Brisas Energy Center, LLC		

10. Mailing Address:	Mr. John Upchurch						
	11011 Richmond Ave., Suite 350						
	City	Houston	**State**	TX	**ZIP**	77042	**ZIP + 4**

11. Country Mailing Information *(if outside USA)*	12. E-Mail Address *(if applicable)*
	johnupchurch@lasbrisasenergy.com

13. Telephone Number	14. Extension or Code	15. Fax Number *(if applicable)*
(281) 636-2017		( ) -

16. Federal Tax ID *(9 digits)*	17. TX State Franchise Tax ID *(11 digits)*	18. DUNS Number *(if applicable)*	19. TX SOS Filing Number *(if applicable)*

20. Number of Employees
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

21. Independently Owned and Operated?
☒ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information ☐ No Change** *(See below)*

****If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.**

23. Regulated Entity Name *(name of the site where the regulated action is taking place)*

Las Brisas Energy Center, LLC

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*	TBD							
	City	Corpus Christi	State	TX	ZIP	78409	ZIP + 4	
25. Mailing Address:	TBD							
	City	Corpus Christi	State	TX	ZIP	78409	ZIP + 4	
26. E-Mail Address:	johnupchurch@lasbrisasenergy.com							

27. Telephone Number	28. Extension or Code	29. Fax Number *(if applicable)*
(281) 636-2017		( ) -

30. Primary SIC Code (4 digits)	31. Secondary SIC Code (4 digits)	32. Primary NAICS Code (5 or 6 digits)	33. Secondary NAICS Code (5 or 6 digits)
4939			

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Electric Power Generation

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	On the Joe Fulton Corridor bordering the west side of the Port of Corpus Christi Bulk Terminal

36. Nearest City	County	State	Nearest ZIP Code
Corpus Christi	Nueces	TX	78409

37. Latitude (N) In Decimal:			38. Longitude (W) In Decimal:		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☒ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☒ Stormwater	☒ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Shanon DiSorbo	41. Title:	Vice President

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(832) 239-8018		(281) 987-3500	disorbos@rpsgroup.com

SECTION V: Authorized Signature

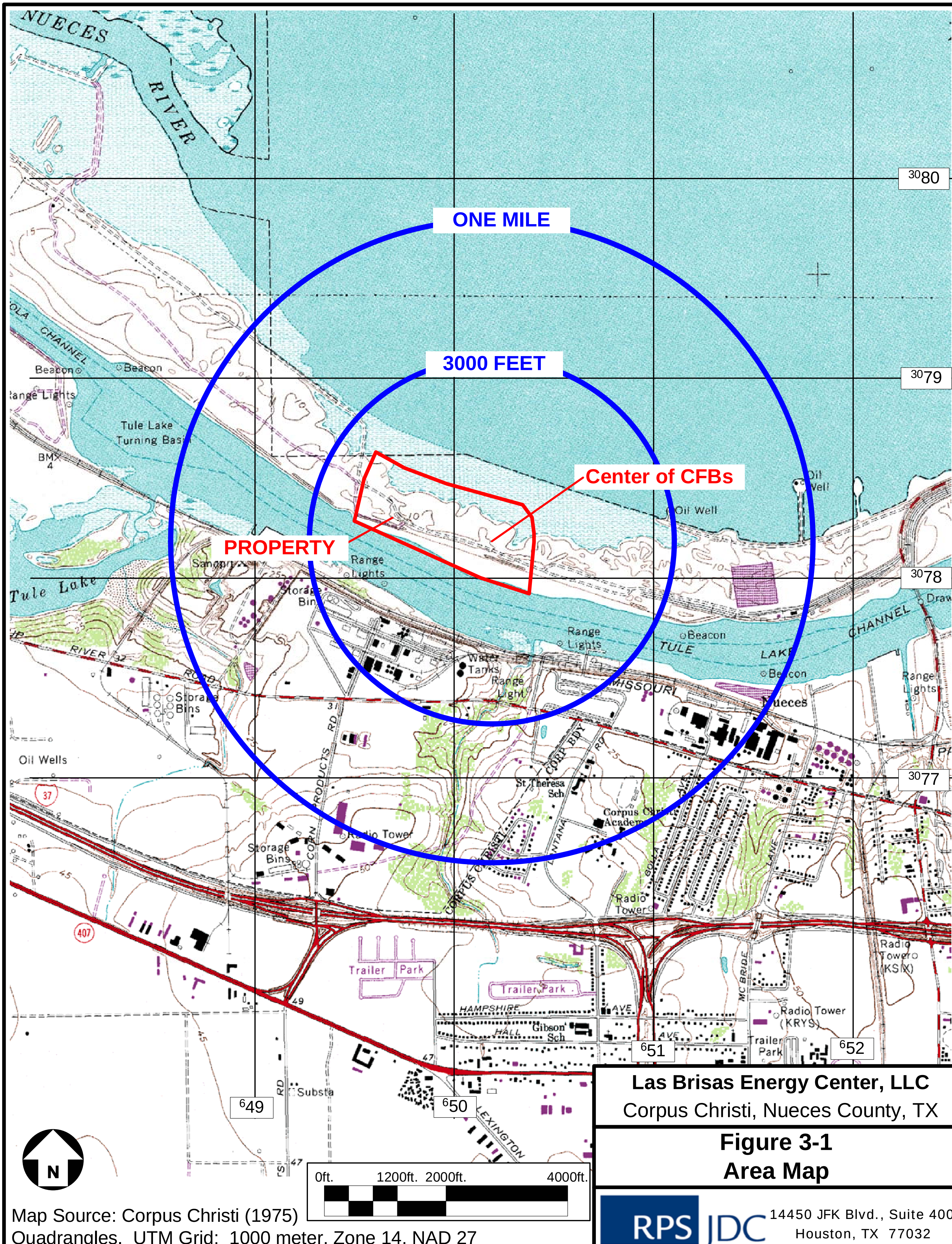
46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	Las Brisas Energy Center, LLC	**Job Title:**	Managing Partner
Name *(In Print)*:	Mr. John Upchurch	**Phone:**	(281) 636-2017
Signature:	[signature]	**Date:**	5/16/2008

Section 3
Area Map and Plot Plan

An area map is shown in Figure 3-1 showing 3,000-ft and one-mile distance markings. An overall plot plan of the facility is provided in Figure 3-2 showing the location of the facilities referenced in this submittal.



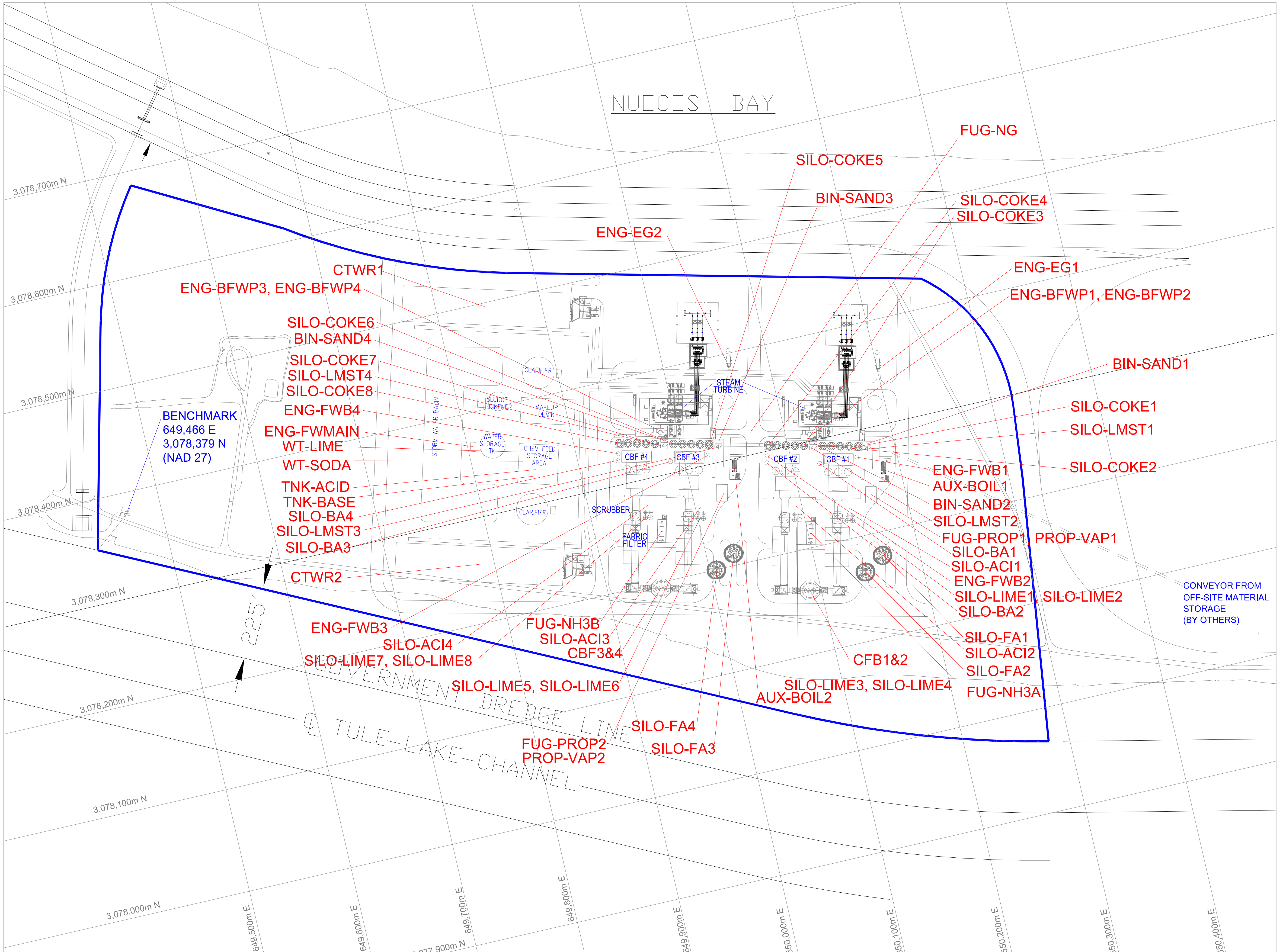
Las Brisas Energy Center, LLC

Corpus Christi, Nueces County, TX

Figure 3-1

Area Map

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



NOTE:
Diesel tanks EPNs are not shown. There is one tank adjacent to each engine.

Las Brisas Energy Center, LLC
Corpus Christi, Nueces County, TX

Figure 3-2
Plot Plan

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

Section 4
Process Description

The proposed facility will consist of four 300-megawatt (MW) (nominal output) circulating fluidized bed (CFB) boilers that will use petroleum coke (pet coke) as fuel. The steam produced from the boilers will be routed to two single turbine generator sets. The power generated will be sold to regional load serving entities for resale via the local electricity transmission and distribution grid. Material handling activities at the site include loading/unloading, transferring, and storage of pet coke, limestone, lime, sand, water treatment materials, and combustion by-products (fly and bottom ash). The following sections describe the different equipment and processes occurring at the site in further detail. A simplified process flow diagram is included at the end of this section as Figure 4-1.

4.1 Circulating Fluidized Bed (CFB) Boilers

The CFB boilers will be designed to fire solid fuel. LBEC proposes to use pet coke as fuel. During startup, natural gas and/or propane will be used prior to initiation of the pet coke. The exhaust flue gas from the first two CFB boilers (FIN: CFB-1 and CFB-2) will exit through a chimney that consists of two stacks (EPN: CFB1 and CFB2). Similarly, the exhaust flue gas from the other two CFB boilers (FIN: CFB-3 and CFB-4) will exit through a second chimney that also consists of two separate stacks (EPN: CFB3 and CFB4). CFB-1 and CFB-2 will fire pet coke producing steam to drive one of the single turbine-generator sets. CFB-3 and CFB-4 will also fire pet coke and will feed steam to a second single turbine-generator. Byproducts from the CFB boilers will include fly ash and bottom ash. Fly ash will be discharged from the CFB boilers and collected with the proposed fabric filters. Bottom ash will be collected and transferred to storage silos. Both the fly ash and bottom ash have potential commercial uses and will be shipped off-site for use or disposal.

The CFB boilers will use the best available control technology (BACT) to reduce emissions including limestone injection directly into the boilers to reduce sulfur dioxide emissions, selective non-catalytic reduction (SNCR) to reduce nitrogen oxide emissions, a polishing scrubber to further reduce acid gas emissions, and finally a fabric filter to reduce particulate and metals emissions.

4.2 Auxiliary Boilers

Two nominally rated 180 MMBtu/hr natural gas-fired auxiliary boilers (EPNs: AUX-BOIL1 and AUX-BOIL2) will be utilized during start-up and shutdown activities to provide auxiliary steam which may be required to stabilize the system. The boilers will be used during the commissioning phase of the project (prior to normal operation) as well as during normal operation. Each auxiliary boiler will not operate more than 2,500 hours per year. The boilers will be designed to include low-NO_x or staged combustion burners that will achieve NO_x emission levels of 0.035 lb/MMBTU.

4.3 Propane Vaporizers

Two nominally rated 16 MMBtu/hr propane vaporizers (EPNs: PROP-VAP1 and PROP-VAP2) will be utilized as a source of CFB start-up fuel in the event natural gas is not available. The vaporizers may be used during the commissioning phase of the project as well as during normal operation. Each vaporizer will not operate more than 2,500 hours per year. Further, the vaporizers will be equipped with conventional low NO_x burners designed to achieve NO_x emission levels of 0.1 lb/MMBTU.

4.4 Material Handling Facilities

Material handling facilities will be required for pet coke, limestone, lime, soda ash, sand, and combustion by-products (fly ash and bottom ash). The materials will be transported to the adjacent site operated by Las Brisas Terminal Company, LLC (LBTC). The materials from the LBTC stockpiles will be delivered to the LBEC material handling systems via conveyors, equipped with hoods to reduce the particulate emissions. Pet coke will be transferred into twenty storage silos. Each CFB boiler will be equipped with five pet coke silos. Each of the CFB boiler pet coke silo groups will be equipped with two fabric filters that will achieve 0.01 grains per dry standard cubic foot (EPNs: SILO-COKE1, SILO-COKE2, SILO-COKE3, SILO-COKE4, SILO-COKE5, SILO-COKE6, SILO-COKE7, and SILO-COKE8). Limestone will be transferred into one of four bunkers, located at each of the CFB boilers, equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPNs: SILO-LMST1, SILO-LMST2, SILO-LMST3, and SILO-LMST4).

Lime will be utilized in the polishing scrubbers installed on each CFB boiler to reduce sulfuric acid and other acid emissions (i.e., hydrogen chloride and hydrogen fluoride) and for water treatment. Lime will be unloaded pneumatically from trucks into nine storage silos, each equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPNs: SILO-LIME1, SILO-LIME2, SILO-LIME3, SILO-LIME4, SILO-LIME5, SILO-LIME6, SILO-LIME7, and SILO-LIME8) to provide a high level of particulate emission control.

Soda ash sill be utilized for water treatment and will be unloaded pneumatically from trucks into a storage silo equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPN: WT-SODA) to provide a high level of particulate emission control.

Sand will be utilized in the boilers to prevent agglomeration when firing pet coke. Sand will be unloaded pneumatically from trucks into four day-bins, each equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPNs: BIN-SAND1, BIN-SAND2, BIN-SAND3, and BIN-SAND4) to provide a high level of particulate emission control.

Fly ash and bottom ash will be generated as by-products of the CFB combustion process. Fly ash will be collected from each CFB fabric filter (baghouse) and bottom ash will be collected from the CFB beds. Each material will be separately conveyed pneumatically to four storage silos, each equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPNs: SILO-FA1, SILO-FA2, SILO-FA3, and SILO-FA4). The bottom ash will undergo a cooling step before transport to the silos. Each silo will have be equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPNs: SILO-BA1, SILO-BA2, SILO-BA3, and SILO-BA4) that provides a high level of particulate emission control. Fly ash and bottom ash collected in the silos will be loaded into trucks for off-site shipment utilizing a dust collection hood over each truck to minimize particulate emissions.

In order to reduce mercury emissions, LBEC may require the use of activated carbon injection to the exhaust gas. In the event that it necessary, LBEC will construct four activated carbon injection silos (one for each boiler). Activated carbon will be unloaded pneumatically from trucks into four silos, each equipped with a fabric filter that will achieve 0.01 grains per dry standard cubic foot (EPNs: SILO-ACI1, SILO-ACI2, SILO-ACI3m and SILO-ACI4) to provide a high level of particulate emission control.

The material handling activities located within the LBEC property boundary are included in this permit application while the material handling activities occurring prior to the custody transfer (i.e., active storage pile, inactive storage pile, conveyors, and etc.) will be authorized under a separate NSR authorization by LBTC.

4.5 Diesel-Fired Emergency Generators

Two nominally rated 1,600 kW diesel-fired emergency generators (EPNs: ENG-EG1 and ENG-EG2) will be installed at the site to provide electricity to the facility in case of power failure. The generators may be used during the commissioning phase of the project as well as during normal operation. Each generator will not operate more than 500 hours per year.

4.6 Diesel-Fired Fire Water Pumps

A nominally rated 360 HP diesel-fired pump (EPN: ENG-FWMAIN) will be installed at the site to provide water in the event of a fire. Four nominally rated 100 HP diesel-fired pumps (EPNs: ENG-FWB1, ENG-FWB2, ENG-FWB3, and ENG-FWB4) will be installed at the site to serve as fire water booster pumps at each of the CFB boilers. The pumps may be used during the commissioning phase of the project as well as during normal operation. Each pump will not operate more than 500 hours per year.

4.7 Diesel-Fired Boiler Feed Water Pumps

Four nominally rated 2,000 HP diesel-fired boiler feed water pumps (EPNs: ENG-BFWP1, ENG-BFWP2, ENG-BFWP3, and ENG-BFWP4) will be installed at the site to serve as emergency boiler feed water pumps at each of the CFB boilers. The pumps may be used during the commissioning phase of the project as well as during normal operation. Each pump will not operate more than 500 hours per year.

4.8 Storage Tanks

Anhydrous ammonia (NH_3) will be stored in pressurized tanks that will supply ammonia for the SNCR system installed on each CFB boiler. The tanks will not generate emissions during normal operations except for fugitive piping equipment emissions (EPNs: FUG-NH3A and FUG-NH3B). These ammonia tanks will be equipped with a vapor recovery system which will route all loading vapors back to the tank truck when transferring ammonia.

Propane, used in the propane vaporizers, will be stored in pressurized tanks. The tanks will not generate emissions during normal operations except for fugitive piping equipment emissions.

Tanks storing acid (EPN: TNK-ACID) and base (EPN: TNK-BASE) for water conditioning and pH control will be fixed roof tanks with atmospheric vents. Because of the very low vapor pressures of these chemicals, emissions from these tanks will be low.

Fixed roof tanks will be used to store diesel fuel for the emergency diesel-fired emergency generators, diesel-fired fire water pumps, and diesel-fired boiler feed water pumps (EPNs: TNK-ENG1, TNK-ENG2, TNK-FWMAIN, TNK-FWB1, TNK-FWB2, TNK-FWB3, TNK-FWB4, TNK-BFWP1, TNK-BFWP2, TNK-BFWP3, and TNK-BFWP4). Since the vapor pressure of diesel is very low, the VOC emissions associated with the storage tanks will be minimal.

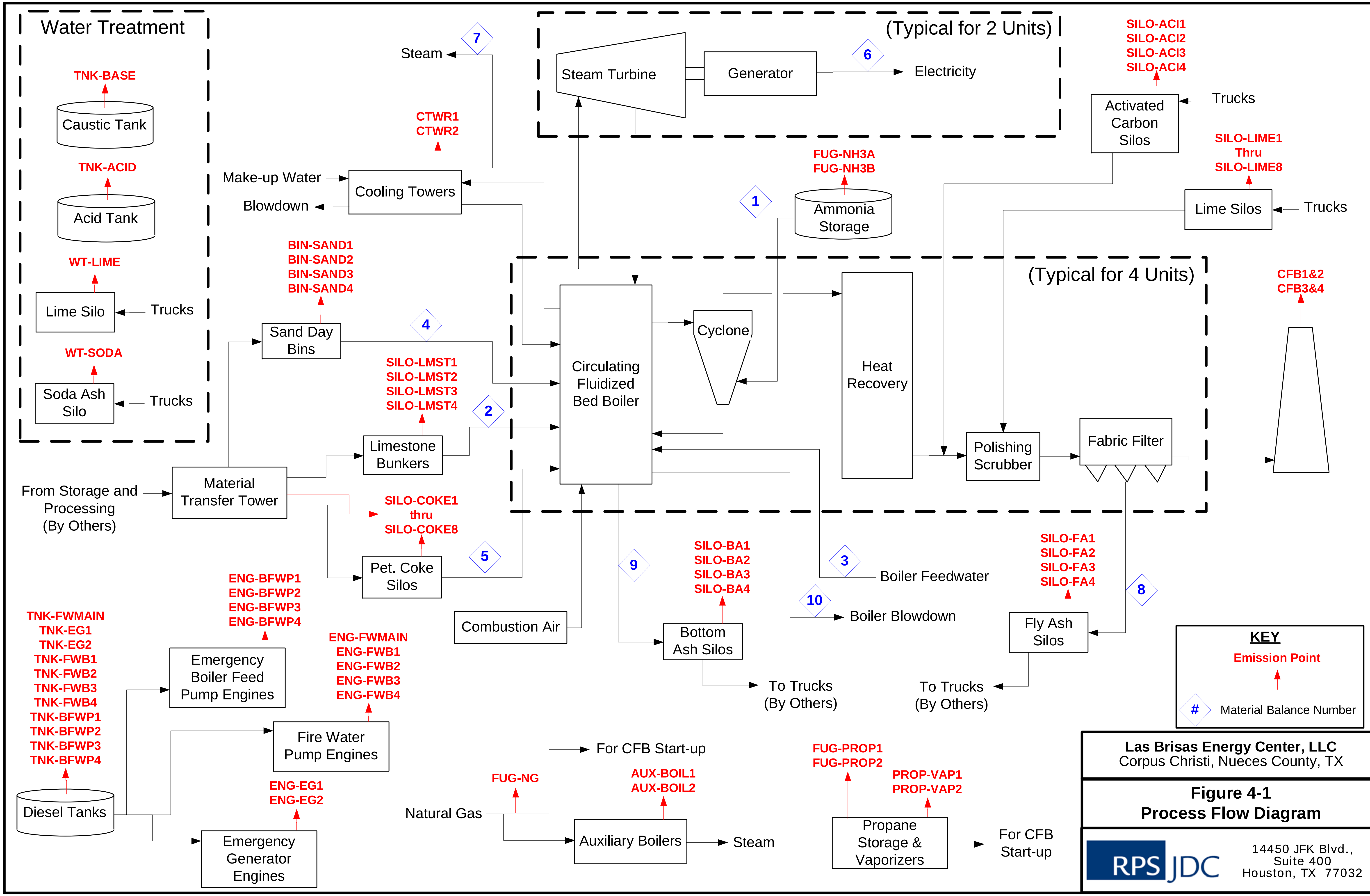
4.9 Fugitive Emissions

As previously noted, this permit application includes piping components associated with the SNCR anhydrous ammonia storage tanks. In addition to the anhydrous ammonia piping components, additional piping components associated with natural gas (EPN: FUG-NG) and propane (EPN: FUG-PROP1 and FUG-PROP2) process equipment are included in this application. Ammonia fugitive emissions will be minimized by implementing an audio, visual, and olfactory (AVO) inspection program.

4.10 Cooling Towers

Raw water from the City of Corpus Christi will be supplied to the LBEC facility via pipeline. The site will require raw water for use as boiler feed water and cooling tower makeup water. The steam turbines will exhaust to a water-cooled surface condenser. Makeup water will be supplied to the condenser hot-well. Condenser cooling will be provided by a circulating water system from field-erected rectangular cooling towers (EPNs: CTWR1 and CTWR2). Particulate matter emissions will be minimized through the use of drift eliminators designed to achieve 0.0005%. Condenser hot-well pumps will pump condensate from the hot-well through low-pressure feed water heaters to the de-aerator.

Four boiler feed pumps will be provided for each of the circulating fluidized bed boiler. The boiler feed water pumps will pump feed water from the deaerator storage tank through two high pressure feed water heaters to the boilers' economizers.



Las Brisas Energy Center, LLC
Corpus Christi, Nueces County, TX

Figure 4-1
Process Flow Diagram

RPS JDC
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Houston, TX 77032

Section 5
Emissions Summary

Emission factors and calculation methods are addressed in this section. Proposed emissions rates are summarized on TCEQ Table 1(a) found at the end of this section. Appendix A contains the emission factors and operations data used to calculate hourly and annual emissions from the proposed facilities.

5.1 Circulated Fluidized Bed (CFB) Boilers

The LBEC CFB boilers will utilize pet coke as the fuel. LBEC is proposing to utilize fuel assays from other CFB projects that are similar to the proposed facility. By comparing the fuel assays and evaluating the emission scenarios for each constituent, a conservative approach is used to estimate short-term and annual emissions for the proposed facility.

The combustion products include criteria pollutants such as nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM), and particulate matter less than 10 microns in diameter (PM_{10}). Firing pet coke will also generate emissions of acidic gases such as sulfuric acid (H_2SO_4.), hydrochloric acid (HCl), or hydrofluoric acid (HF); and trace metals such as lead (Pb) and mercury (Hg). Because each CFB boiler will be equipped with selective non-catalytic reduction (SNCR) that utilizes ammonia to reduce NO_X emissions, ammonia (NH_3) slip emissions are also expected.

Short-term and annual emission factors for the CFB boilers were estimated using a combination of material balance equations based upon elemental composition of the solid fuel, US EPA's Compilation of Air Pollutant Emission Factors (AP-42, 5th Edition), information gathered from the BACT emission limits discussed in Section 6.0, and descriptions in the equipment manufacturer's guarantees. The emission factors for NO_x, SO_2, CO, VOC, PM/PM_{10}, H_2SO_4, HCl, HF, Pb, Hg, and NH_3 are summarized in Table A-1 of Appendix A. The methodology used to estimate emissions for each of these constituents is described below.

The CFB boilers will be started up by firing natural gas or vaporized propane until they reach about 30% of their full heat input load. During the startup operation, the control equipment (i.e., fabric filter and SNCR) will be by-passed until the flue gases reach temperature where these fabric filter systems and SNCR processes are effective. Based on experience at similar facilities, LBEC expects that the natural gas or vaporized propane will be fired for about 7 hours and that the control equipment will be bypassed for approximately eight hours. Upon reaching 30% of the design heat rate, pet coke will be introduced and, within a short time period, all control equipment will be working at steady state conditions.

Emission calculation details for the CFB boilers are included in Appendix A on Table A-2 through A-9.

5.2 Auxiliary Boilers

Emission calculation details for the auxiliary boilers are included in Appendix A on Table A-18. Emissions for the combustion products were calculated using emission factors from Table 1.4.2 of EPA's AP-42 document for Natural Gas Combustion and equipment manufacturer guarantees.

5.3 Propane Vaporizers

Emission calculation details for the propane vaporizers are included in Appendix A on Table A-19. Emissions for the combustion products were calculated using emission factors from Table 1.5-1 of EPA's AP-42 document for Liquefied Petroleum Gas Combustion and equipment manufacturer guarantees.

5.4 Material Handling Facilities

LBEC will utilize LBTC for a significant portion of material handling activities. Figure 4-1 provides a general material handling process flow diagram that details which activities are included in this permit application. The following describes the material handling activities included in this permit application and the basis for the emission calculation estimates.

5.4.1 Pet Coke

Emission calculation details for pet coke handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., pet coke fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.2 Limestone

Emission calculation details for limestone handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., limestone fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.3 Lime

Emission calculation details for lime handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., lime fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.4 Soda Ash

Emission calculation details for soda ash handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., soda ash fabric filter vents). Emissions from the fabric filter vent were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.5 Sand

Emission calculation details for sand handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., sand fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.6 Fly Ash

Emission calculation details for fly ash handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., fly ash fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.7 Bottom Ash

Emission calculation details for bottom ash handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., bottom ash fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.4.8 Activated Carbon

Emission calculation details for activated carbon handling activities included in this application are included in Appendix A on Table A-11. The table quantifies emissions for each activity associated with the LBEC operations (i.e., fabric filter vents). Emissions from the fabric filter vents were calculated based on an expected flow rate and an outlet grain loading rate of 0.01 gr/dscf.

5.5 Diesel-Fired Emergency Generators

Emission calculation details for diesel-fired emergency generators included in this application are included in Appendix A on Table A-13. Emissions of VOC, NO_X, CO, SO_2, and PM from the diesel-fired emergency generators are based emission factors noted in the calculations. Hourly emissions are calculated by multiplying the emission factor by the engine horsepower or heat input. Annual emissions are calculated by multiplying the hourly emissions by the number of operating hours per year.

5.6 Diesel-Fired Fire Water Pumps

Emission calculation details for diesel-fired fire water pumps and booster pumps included in this application are included in Appendix A on Table A-14 and A-15. Emissions of VOC, NO_X, CO, SO_2, and PM from the diesel-fired water and booster pumps are based emission factors noted in the calculations. Hourly emissions are calculated by multiplying the emission factor by the engine horsepower or heat input. Annual emissions are calculated by multiplying the hourly emissions by the number of operating hours per year.

5.7 Diesel-Fired Boiler Feed Water Pumps

Emission calculation details for diesel-fired boiler feed water pumps included in this application are included in Appendix A on Table A-16. Emissions of VOC, NO_X, CO, SO_2, and PM from the diesel-fired boiler feed water pumps are based emission factors noted in the calculations. Hourly emissions are calculated by multiplying the emission factor by the engine horsepower or heat input. Annual emissions are calculated by multiplying the hourly emissions by the number of operating hours per year.

5.8 Storage Tanks

Emission calculation details for storage tanks included in this application are included in Appendix A on Table A-17. For storage tanks, annual storage tank emissions were estimated using the emission calculation methods in AP-42 Section 7. Per the TCEQ's *Technical Guidance Package for Chemical Sources: Storage Tanks, February 2001*, the short-term emission calculations for the fixed roof tanks were based on the following equation:

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

Where:

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

L_W = working loss calculated using AP-42, Chapter 7 at maximum liquid surface temperature, lbs/yr (Note: units are lbs/yr not lbs/hr. L_W must be calculated using a turnover factor, K_N, of 1).

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

N = number of turnovers per year

T_{CG} = tank capacity, gals

5.9 Fugitive Emissions

Emission calculation details for the fugitive emissions included in this application are included in Appendix A on Table A-10. Fugitive emission rates of ammonia (NH_3) and VOC from piping components and ancillary equipment associated with the SCNR and fuel systems were estimated using the methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives, October 2000*.

Each fugitive component was classified first by equipment type (i.e., valve, pump, flange, etc.) and then by material type (i.e., gas/vapor, light liquid, and heavy liquid). An uncontrolled emission rate was obtained by multiplying the number of fugitive components of a particular equipment/material type by the appropriate emission factor. To obtain controlled fugitive emission rates, the uncontrolled rates were multiplied by a control factor, which was determined by the leak detection and repair (LDAR) program employed at the facility.

5.10 Cooling Towers

Emission calculation details for the cooling towers included in this application are included in Appendix A on Table A-12. PM emissions from cooling towers were estimated using the drift loss rate (0.0005%) and data for total dissolved solids from potential water supplies and cycles of concentration.

The PM_{10} emission rate from the was calculated using a method that assumes that each droplet leaving the tower forms one solid particulate as the water evaporates. Based on this assumption, the mass of the solids in the droplet must equal the mass of solids in the solid particle. The equation shown on Table A-12 was used to calculate the diameter of the solid particle for each water droplet diameter. The solid particle sizes were calculated for a typical water droplet size distribution. Using straight-line interpolation for a particle size of 10 μm in diameter, the percent of mass emissions less than 10 μm is determined from a typical cooling tower particle size distribution. This factor was applied to the total particulate emissions to estimate the PM_{10} emissions.

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

Permit Number:	TBD	RN Number:	TBD	Date:	5/19/2008
Company Name:	Las Brisas Energy Center, LLC				

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

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
CFB1&2	CFB-1	CFB Boiler 1	NO_x	308	944	14	650,089	3,078,160	TBD	45.0	16.5	175.0			
			SO_2	714	2,620										
			CO	462	2,024										
			VOC	15.4	67.5										
			PM_{10}	182	702										
			H_2SO_4	114	499										
			NH_3	16.0	35.1										
			Hg	0.01	0.04										
			HCl	13.65	11.97										
			HF	1.18	1.10										
			Pb	0.04	0.03										
			SO_2 (startup)	4,910.48	---										
			HF (startup)	11.81	---										
			H_2SO_4 (startup)	315.74	---										
			HCl (startup)	136.48	---										
CFB1&2	CFB-2	CFB Boiler 2	NO_x	308	944		Combined Stack								
			SO_2	714	2,620										
			CO	462	2,024										
			VOC	15.4	67.5										
			PM_{10}	182	702										
			H_2SO_4	114	499										
			NH_3	16.0	35.1										
			Hg	0.01	0.04										
			HCl	13.65	11.97										
			HF	1.18	1.10										
			Pb	0.04	0.03										
			SO_2 (startup)	4,910.48	---										
			HF (startup)	11.81	---										
			H_2SO_4 (startup)	315.74	---										
			HCl (startup)	136.48	---										

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1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^oF) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
CFB3&4	CFB-3	CFB Boiler 3	NO_x	308	944	14	649,950	3,078,195	TBD	45.0	16.5	175.0			
			SO_2	714	2,620										
			CO	462	2,024										
			VOC	15.4	67.5										
			PM_{10}	182	702										
			H_2SO_4	114	499										
			NH_3	16.0	35.1										
			Hg	0.01	0.04										
			HCl	13.65	11.97										
			HF	1.18	1.10										
			Pb	0.04	0.03										
			SO_2 (startup)	4,910.48	---										
			HF (startup)	11.81	---										
			H_2SO_4 (startup)	315.74	---										
			HCl (startup)	136.48	---										
CFB3&4	CFB-4	CFB Boiler 4	NO_x	308	944		Combined Stack								
			SO_2	714	2,620										
			CO	462	2,024										
			VOC	15.4	67.5										
			PM_{10}	182	702										
			H_2SO_4	114	499										
			NH_3	16.0	35.1										
			Hg	0.01	0.04										
			HCl	13.65	11.97										
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			SO_2 (startup)	4,910.48	---										
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			H_2SO_4 (startup)	315.74	---										
			HCl (startup)	136.48	---										

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

Permit Number:	TBD	RN Number:	TBD	Date:	5/19/2008
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AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS									
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^oF) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
AUX-BOIL1	AUX-BOIL1	Auxiliary Boiler for Units 1 & 2	PM10	1.38	1.72	14	650,184	3,078,257	TBD	TBD	TBD	TBD			
			VOC	1.00	1.25										
			NOx	6.30	7.88										
			CO	15.03	18.79										
			SO2	0.12	0.15										
AUX-BOIL2	AUX-BOIL2	Auxiliary Boiler for Units 3 & 4	PM10	1.38	1.72	14	650,045	3,078,291	TBD	TBD	TBD	TBD			
			VOC	1.00	1.25										
			NOx	6.30	7.88										
			CO	15.03	18.79										
			SO2	0.12	0.15										
PROP-VAP1	PROP-VAP1	Propane Vaporizer for Units 1 & 2	PM10	0.11	0.13	14	650,167	3,078,237	TBD	TBD	TBD	TBD			
			VOC	0.05	0.06										
			NOx	1.60	2.00										
			CO	1.29	1.61										
PROP-VAP2	PROP-VAP2	Propane Vaporizer for Units 3 & 4	PM10	0.11	0.13	14	650,031	3,078,271	TBD	TBD	TBD	TBD			
			VOC	0.05	0.06										
			NOx	1.60	2.00										
			CO	1.29	1.61										
SILO-FA1	SILO-FA1	Fly Ash Silo No. 1	PM/PM_{10}	0.63	2.74	14	650,166	3,078,178	TBD	TBD	TBD	amb.			
SILO-FA2	SILO-FA2	Fly Ash Silo No. 2	PM/PM_{10}	0.63	2.74	14	650,146	3,078,166	TBD	TBD	TBD	amb.			
SILO-FA3	SILO-FA3	Fly Ash Silo No. 3	PM/PM_{10}	0.63	2.74	14	650,026	3,078,211	TBD	TBD	TBD	amb.			

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

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1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground (Feet)	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)		Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^{o}F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
SILO-FA4	SILO-FA4	Fly Ash Silo No. 4	PM/PM_{10}	0.63	2.74	14	650,007	3,078,199	TBD	TBD	TBD	amb.			
SILO-BA1	SILO-BA1	Bottom Ash Silo No. 1	PM/PM_{10}	0.47	2.07	14	650,126	3,078,277	TBD	TBD	TBD	amb.			
SILO-BA2	SILO-BA2	Bottom Ash Silo No. 2	PM/PM_{10}	0.47	2.07	14	650,077	3,078,289	TBD	TBD	TBD	amb.			
SILO-BA3	SILO-BA3	Bottom Ash Silo No. 3	PM/PM_{10}	0.47	2.07	14	649,987	3,078,311	TBD	TBD	TBD	amb.			
SILO-BA4	SILO-BA4	Bottom Ash Silo No. 4	PM/PM_{10}	0.47	2.07	14	649,938	3,078,324	TBD	TBD	TBD	amb.			
SILO-COKE1	SILO-COKE1	Coke Silo No.1	PM/PM_{10}	2.83	8.18	14	650,166	3,078,285	TBD	TBD	TBD	amb.			
SILO-COKE2	SILO-COKE2	Coke Silo No.2	PM/PM_{10}	2.83	8.18	14	650,132	3,078,293	TBD	TBD	TBD	amb.			
SILO-COKE3	SILO-COKE3	Coke Silo No.3	PM/PM_{10}	2.83	8.18	14	650,114	3,078,297	TBD	TBD	TBD	amb.			
SILO-COKE4	SILO-COKE4	Coke Silo No.4	PM/PM_{10}	2.83	8.18	14	650,081	3,078,305	TBD	TBD	TBD	amb.			
SILO-COKE5	SILO-COKE5	Coke Silo No.5	PM/PM_{10}	2.83	8.18	14	650,027	3,078,318	TBD	TBD	TBD	amb.			
SILO-COKE6	SILO-COKE6	Coke Silo No.6	PM/PM_{10}	2.83	8.18	14	649,994	3,078,327	TBD	TBD	TBD	amb.			
SILO-COKE7	SILO-COKE7	Coke Silo No.7	PM/PM_{10}	2.83	8.18	14	649,976	3,078,331	TBD	TBD	TBD	amb.			
SILO-COKE8	SILO-COKE8	Coke Silo No.8	PM/PM_{10}	2.83	8.18	14	649,943	3,078,339	TBD	TBD	TBD	amb.			
SILO-LMST1	SILO-LMST1	Limestone Bunker No. 1	PM/PM_{10}	0.07	0.10	14	650,174	3,078,280	TBD	TBD	TBD	amb.			
SILO-LMST2	SILO-LMST2	Limestone Bunker No. 2	PM/PM_{10}	0.07	0.10	14	650,122	3,078,293	TBD	TBD	TBD	amb.			
SILO-LMST3	SILO-LMST3	Limestone Bunker No. 3	PM/PM_{10}	0.07	0.10	14	650,034	3,078,314	TBD	TBD	TBD	amb.			
SILO-LMST4	SILO-LMST4	Limestone Bunker No. 4	PM/PM_{10}	0.07	0.10	14	649,984	3,078,327	TBD	TBD	TBD	amb.			
SILO-ACI1	SILO-ACI1	Carbon for ACI Silo No. 1	PM/PM_{10}	0.14	0.21	15	650,144	3,078,229	TBD	TBD	TBD	amb.			
SILO-ACI2	SILO-ACI2	Carbon for ACI Silo No. 2	PM/PM_{10}	0.14	0.21	16	650,095	3,078,242	TBD	TBD	TBD	amb.			
SILO-ACI3	SILO-ACI3	Carbon for ACI Silo No. 3	PM/PM_{10}	0.14	0.21	17	650,006	3,078,263	TBD	TBD	TBD	amb.			
SILO-ACI4	SILO-ACI4	Carbon for ACI Silo No. 4	PM/PM_{10}	0.14	0.21	18	651,956	3,078,275	TBD	TBD	TBD	amb.			
SILO-LIME1	SILO-LIME1	Lime Silo No. 1	PM/PM_{10}	0.14	0.21	14	650,142	3,078,220	TBD	TBD	TBD	amb.			
SILO-LIME2	SILO-LIME2	Lime Silo No. 2	PM/PM_{10}	0.14	0.21	14	650,142	3,078,220	TBD	TBD	TBD	amb.			
SILO-LIME3	SILO-LIME3	Lime Silo No. 3	PM/PM_{10}	0.14	0.21	14	650,094	3,078,232	TBD	TBD	TBD	amb.			
SILO-LIME4	SILO-LIME4	Lime Silo No. 4	PM/PM_{10}	0.14	0.21	14	650,094	3,078,232	TBD	TBD	TBD	amb.			
SILO-LIME5	SILO-LIME5	Lime Silo No. 5	PM/PM_{10}	0.14	0.21	14	650,004	3,078,254	TBD	TBD	TBD	amb.			
SILO-LIME6	SILO-LIME6	Lime Silo No. 6	PM/PM_{10}	0.14	0.21	14	650,004	3,078,254	TBD	TBD	TBD	amb.			

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate		4. UTM Coordinates of Emission Point			Source						
									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^oF) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
SILO-LIME7	SILO-LIME7	Lime Silo No. 7	PM/PM_{10}	0.14	0.21	14	649,955	3,078,266	TBD	TBD	TBD	amb.			
SILO-LIME8	SILO-LIME8	Lime Silo No. 8	PM/PM_{10}	0.14	0.21	14	649,955	3,078,266	TBD	TBD	TBD	amb.			
BIN-SAND1	BIN-SAND1	Unit 1 Sand Day Bin	PM/PM_{10}	0.04	0.06	14	650,175	3,078,285	TBD	TBD	TBD	amb.			
BIN-SAND2	BIN-SAND2	Unit 2 Sand Day Bin	PM/PM_{10}	0.04	0.06	14	650,124	3,078,298	TBD	TBD	TBD	amb.			
BIN-SAND3	BIN-SAND3	Unit 3 Sand Day Bin	PM/PM_{10}	0.04	0.06	14	650,036	3,078,319	TBD	TBD	TBD	amb.			
BIN-SAND4	BIN-SAND4	Unit 4 Sand Day Bin	PM/PM_{10}	0.04	0.06	14	649,985	3,078,332	TBD	TBD	TBD	amb.			
WT-LIME	WT-LIME	Water Treatment Lime Silo	PM/PM_{10}	0.09	0.13	14	649,852	3,078,352	TBD	TBD	TBD	amb.			
WT-SODA	WT-SODA	Water Treatment Soda Ash Silo	PM/PM_{10}	0.09	0.13	14	649,849	3,078,343	TBD	TBD	TBD	amb.			
CTWR1	CTWR1	Cooling Tower #1	PM	12.01	52.60	14	649,848	3,078,495	TBD	0.003	0.003	70			
			PM_{10}	0.29	1.29										
CTWR2	CTWR2	Cooling Tower #2	PM	12.01	52.60	14	649,786	3,078,256	TBD	0.003	0.003	70			
			PM_{10}	0.29	1.29										
ENG-EG1	ENG-EG1	Diesel-Fired Emergency Generator 1	NO_x	24.30	6.10	14	650,062	3,078,387	12	0.28	135	845			
			CO	13.30	3.30										
			PM_{10}	0.61	0.15										
			VOC	1.46	0.37										
			SO_2	0.46	0.12										
			H_2SO_4	0.04	0.009										

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									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
ENG-EG2	ENG-EG2	Diesel-Fired Emergency Generator 2	NO_x	24.30	6.10	14	650,201	3,078,353	12	0.28	135	845			
			CO	13.30	3.30										
			PM_{10}	0.61	0.15										
			VOC	1.46	0.37										
			SO_2	0.46	0.12										
			H_2SO_4	0.04	0.009										
ENG-FWMAIN	ENG-FWMAIN	Main Diesel-Fired Fire Water Pump	NO_x	2.38	0.60	14	649,805	3,078,368	12	0.28	135	845			
			CO	2.06	0.52										
			PM_{10}	0.12	0.03										
			VOC	0.89	0.22										
			SO_2	0.07	0.02										
			H_2SO_4	0.01	0.002										
ENG-FWB1	ENG-FWB1	Diesel-Fired Fire Water Booster Pump 1	NO_x	0.66	0.17	14	650,162	3,078,275	12	0.28	90	845			
			CO	0.57	0.14										
			PM_{10}	0.03	0.01										
			VOC	0.25	0.06										
			SO_2	0.02	0.01										
			H_2SO_4	0.002	0.001										
ENG-FWB2	ENG-FWB2	Diesel-Fired Fire Water Booster Pump 2	NO_x	0.66	0.17	14	650,078	3,078,296	12	0.28	90	845			
			CO	0.57	0.14										
			PM_{10}	0.03	0.01										
			VOC	0.25	0.06										
			SO_2	0.02	0.01										
			H_2SO_4	0.002	0.001										

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									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (°F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
ENG-FWB3	ENG-FWB3	Diesel-Fired Fire Water Booster Pump 3	NO_x	0.66	0.17	14	650,023	3,078,309	12	0.28	90	845			
			CO	0.57	0.14										
			PM_{10}	0.03	0.01										
			VOC	0.25	0.06										
			SO_2	0.02	0.01										
			H_2SO_4	0.002	0.001										
ENG-FWB4	ENG-FWB4	Diesel-Fired Fire Water Booster Pump 4	NO_x	0.66	0.17	14	649,940	3,078,330	12	0.28	90	845			
			CO	0.57	0.14										
			PM_{10}	0.03	0.01										
			VOC	0.25	0.06										
			SO_2	0.02	0.01										
			H_2SO_4	0.002	0.001										
ENG-BFWP1	ENG-BFWP1	Diesel-Fired Boiler Feed Water Pump 1	NO_x	13.23	3.31	14	650,125	3,078,306	30	1.67	90	845			
			CO	11.46	2.87										
			PM_{10}	0.66	0.17										
			VOC	4.94	1.24										
			SO_2	0.40	0.10										
			H_2SO_4	0.031	0.008										
ENG-BFWP2	ENG-BFWP2	Diesel-Fired Boiler Feed Water Pump 2	NO_x	13.23	3.31	14	650,125	3,078,306	30	1.67	90	845			
			CO	11.46	2.87										
			PM_{10}	0.66	0.17										
			VOC	4.94	1.24										
			SO_2	0.40	0.10										
			H_2SO_4	0.031	0.008										

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									5. Height Above Ground (Feet)	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)		Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^{o}F) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
ENG-BFWP3	ENG-BFWP3	Diesel-Fired Boiler Feed Water Pump 3	NO_x	13.23	3.31	14	649,986	3,078,341	30	1.67	90	845			
			CO	11.46	2.87										
			PM_{10}	0.66	0.17										
			VOC	4.94	1.24										
			SO_2	0.40	0.10										
			H_2SO_4	0.031	0.008										
ENG-BFWP4	ENG-BFWP4	Diesel-Fired Boiler Feed Water Pump 4	NO_x	13.23	3.31	14	649,986	3,078,341	30	1.67	90	845			
			CO	11.46	2.87										
			PM_{10}	0.66	0.17										
			VOC	4.94	1.24										
			SO_2	0.40	0.10										
			H_2SO_4	0.031	0.008										
TNK-FWMAIN	TNK-FWMAIN	Diesel Tank for Main Diesel-Fired Fire Water Pump	VOC	0.0104	0.0002	14	649,805	3,078,368	4	0.003	0.003	amb.			
TNK-EG1	TNK-EG1	Diesel Tank for Emergency Generator 1	VOC	0.0104	0.0001	14	650,062	3,078,387	4	0.003	0.003	amb.			
TNK-EG2	TNK-EG2	Diesel Tank for Emergency Generator 2	VOC	0.0104	0.0001	14	650,201	3,078,353	4	0.003	0.003	amb.			
TNK-FWB1	TNK-FWB1	Diesel Tank for Fire Water Booster Pump 1	VOC	0.0104	0.0003	14	650,162	3,078,275	4	0.003	0.003	amb.			
TNK-FWB2	TNK-FWB2	Diesel Tank for Fire Water Booster Pump 2	VOC	0.0104	0.0003	14	650,078	3,078,296	4	0.003	0.003	amb.			
TNK-FWB3	TNK-FWB3	Diesel Tank for Fire Water Booster Pump 3	VOC	0.0104	0.0003	14	650,023	3,078,309	4	0.003	0.003	amb.			
TNK-FWB4	TNK-FWB4	Diesel Tank for Fire Water Booster Pump 4	VOC	0.0104	0.0003	14	649,940	3,078,330	4	0.003	0.003	amb.			
TNK-BFWP1	TNK-BFWP1	Diesel Tank for Boiler Feed Water Pump 1	VOC	0.0104	0.0004	14	650,125	3,078,306	4	0.003	0.003	amb.			
TNK-BFWP2	TNK-BFWP2	Diesel Tank for Boiler Feed Water Pump 2	VOC	0.0104	0.0004	14	650,125	3,078,306	4	0.003	0.003	amb.			
TNK-BFWP3	TNK-BFWP3	Diesel Tank for Boiler Feed Water Pump 3	VOC	0.0104	0.0004	14	649,986	3,078,341	4	0.003	0.003	amb.			

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
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									5. Height Above Ground	6. Stack Exit Data			7. Fugitives		
EPN (A)	FIN (B)	NAME (C)		Pounds per Hour (A)	TPY (B)	Zone	East (Meters)	North (Meters)	(Feet)	Diameter (Feet) (A)	Velocity (fps) (B)	Temp (^oF) (C)	Length (ft) (A)	Width (ft) (B)	Axis Degrees (C)
TNK-BFWP4	TNK-BFWP4	Diesel Tank for Boiler Feed Water Pump 4	VOC	0.0104	0.0004	14	649,986	3,078,341	4	0.003	0.003	amb.			
TNK-ACID	TNK-ACID	Acid Storage Tank	H2SO4	0.1616	0.0032	14	649,858	3,078,327	16	0.003	0.003	amb.			
TNK-BASE	TNK-BASE	Base Storage Tank	NaOH	0.0688	0.0014	14	649,859	3,078,333	16	0.003	0.003	amb.			
FUG-NH3A	FUG-NH3A	Fugitives: Ammonia	NH_3	0.10	0.45	14	650,103	3,078,214	3	0.003	0.003	amb.			
FUG-NH3B	FUG-NH3B	Fugitives: Ammonia	NH_3	0.10	0.45	14	649,963	3,078,248	3	0.003	0.003	amb.			
FUG-NG	FUG-NG	Fugitives: Natural Gas	VOC	0.19	0.84	14	650,067	3,078,321	3	0.003	0.003	amb.			
FUG-PROP1	FUG-PROP1	Fugitives: Propane	VOC	0.41	1.80	14	650,167	3,078,237	3	0.003	0.003	amb.			
FUG-PROP2	FUG-PROP2	Fugitives: Propane	VOC	0.41	1.80	14	650,031	3,078,271	3	0.003	0.003	amb.			

FIN = Facility Identification Numbe

TCEQ-10153 (Revised 06-30-03)
Table 1(a)-Emission Point Summary - These forms are for use by sources subject to th
New Source Review Program and may be revised [ANSRG95A:7026.v3

Section 6
BACT Analysis

The TCEQ regulations in 30 TAC Chapter 116 and federal PSD regulations require that Best Available Control Technology (BACT) be applied to minimize the emissions of pollutants from new and modified facilities. The federal PSD requirement is applicable to emissions of pollutants subject to review, which include NO_x, Ozone (VOC), CO, SO_2, H_2SO_4, and PM/PM_{10} for the Las Brisas Energy Center. This section describes the control technologies and corresponding level of emissions proposed to meet these BACT requirements for the project. Regardless of whether the pollutant triggers PSD, BACT as required under 30 TAC Chapter 116 applies to new facilities or sources of emissions.

BACT is determined on a case-by-case basis taking into consideration technical practicability and economic reasonableness. For PSD BACT requirements, energy and environmental impacts should also be considered. TCEQ uses a three-tiered BACT review process. Control technology alternatives are identified for each new and modified source of pollutants based on knowledge of the applicant's particular industry and previous regulatory decisions for other identical or similar sources. In the first tier, controls accepted as BACT in recent permit reviews for the same process/industry are approved as BACT. The second tier considers controls that have been accepted as BACT in recent permits for similar streams in a different process or industry. The third tier of review is a detailed technical and economic analysis of all control options available for the process being reviewed. The three-tiered approach was followed in the selection of BACT for the subject facilities.

Because the Las Brisas Energy Center is a new plant, all emission sources at the plant are subject to BACT review. This included the CFB boilers, materials handling facilities, reciprocating engines associated with the emergency generators and fire water pumps, storage tanks, fugitive emissions, and cooling towers. TCEQ has well-defined BACT requirements for each of these types of facilities based on the first tier of the three-tiered BACT determination process. Therefore, the BACT analysis was not required to go beyond the first tier. The LBEC electric generation facility will meet or exceed the BACT limits established in the most recent CFB permits issued in Texas, namely Flexible Permit No. 76044 and PSD-TX-1053 issued to

Formosa Plastics and Permit No. 45586 and PSD-TX-1055 issued to Calhoun County Navigation District.

TCEQ has published guidance documents containing the BACT requirements for each of these facility types. The guidance documents are periodically updated when the industry standard for control changes. The guidance documents were used as the basis of the BACT determinations, supplemented by updates from TCEQ of changes which may not yet have been incorporated into the guidance documents. Each equipment type and pollutant emitted from the project is addressed separately in the remainder of this section.

The following sections of the application describe the BACT analysis for the activities covered in this amendment.

6.1 Circulated Fluidized Bed (CFB) Boilers

The combustion products include criteria pollutants such as NO_X, SO_2, CO, VOC, and PM/PM_{10}/$PM_{2.5.}$ Firing pet coke will also generate emissions of H_2SO_4., HCl, or HF; and trace metals such as Pb and Hg. Because each CFB boiler will be equipped with a SNCR control device, emissions from NH_3 slip are also expected.

In summary, the CFB boilers will use the best available control technology (BACT) to reduce emissions including limestone injection directly into the boilers to reduce sulfur dioxide emissions, selective non-catalytic reduction (SNCR) to reduce nitrogen oxide emissions, a polishing scrubber to further reduce acid gas emissions, and finally a fabric filter to reduce particulate and metals emissions. The proposed BACT emission limitations for the CFB boilers are included in Table A-2 of Appendix A.

6.1.1 NO_x Emissions

In CFB boilers, a level of NO_x emissions control is achieved through fluidized bed combustion boiler design that provides a lower peak combustion temperature and longer residence time in the furnace. In CFB boilers, the bed material is fluidized with a combination of primary and secondary air, and combustion gases. The combustion of the fuel occurs in two zones: a primary reducing zone in the lower section of the furnace and the final combustion zone located above the upper level of secondary air inlets to the furnace. This staged combustion process effectively suppresses NO_x formation. In CFB boilers, combustion takes place at temperatures ranging from 1,500 to 1,650°F, and the high degree of mixing in the bed results in these temperatures being uniform throughout the bed. The thermal NO_x formation, a high temperature process occurring mainly at temperatures >2,000°F, is lower in CFB boilers, thereby significantly reducing the NO_x production in the combustion chamber. Additional NO_x emissions control can be achieved through the use of SNCR or selective catalytic reduction (SCR) add-on control systems to convert NO_x to nitrogen and water.

The SNCR process utilizes elevated temperatures to catalyze the NO_X-ammonia reaction. For most effective SNCR operation, the temperature of the gas in the reaction zone must be in the range of 1,600 to 1,800°F. The effectiveness of this method is also dependent on initial NO_x concentration, residence time, and mixing in the reaction zone. Since an SNCR system does not need a catalyst to facilitate the NO_x reduction reaction, it is much simpler control technique that is appropriately applied to CFB boilers. SNCR is a demonstrated technology for control for NO_x emissions from CFB boilers.

In the SCR system the NO_X-ammonia reaction is catalyzed by a vanadium-based catalyst. The flue gas is passed through a catalyst bed in the presence of ammonia. Typically, the SCR reactor is located between the economizer and air heater to assure the optimum operating temperature of 700 to 750 °F. Ammonia is injected after the economizer and prior to the catalyst bed and reacts with NO_X to form nitrogen and water. The SCR system performance depends upon NO_x concentration, ammonia feed rate, flue gas and ammonia mixing, catalyst type, volume, age, and operating temperature.

Currently, application of SCR technology on a CFB is limited because the relatively high concentration of PM in the flue gas that would plug and poison the catalyst bed, thereby reducing its effectiveness and control efficiency. Use of an SCR after PM control (baghouse) would protect the catalyst, but the flue gas stream would require re-heating to allow the SCR to work effectively. Pre-heating the flue gas will consume more fuel and consequently result in more combustion generated air emissions.

Due to limitations noted above, SCR systems are not used for NO_x control on CFB boilers. LBEC maintains that the CFB design and use of SNCR controls is BACT meeting the emission limitations of 0.1 lb/MMBTU on a short-term basis and 0.07 lb/MMBTU on an annual basis.

6.1.2 SO_2 Emissions

Unique to the fluidized bed process, sorbent (crushed limestone) is injected directly into the fluidized bed of the furnace, where it comes into direct contact with the SO_2 produced from the oxidation of fuel sulfur. Through the use of limestone sorbent material, sulfur present in the fuel is retained in the circulating solids in the form of calcium sulfate ($CaSO_4$), allowing a higher sulfur retention rate. Because of the excellent mixing of gases and sorbents in the bed, the CFB requires less sorbent per unit mass of SO_2 produced than other conventional combustion technologies. The design of a CFB boiler provides for removal of SO_2, typically greater than 98%, in the combustion process without the use of add-on post-combustion controls. Limiting the formation of SO_2 reduces the amount of SO_3 formed, thereby providing reducing sulfuric acid mist.

Within the furnace, limestone is first reduced or calcinated to calcium oxide. The calcium oxide then quickly reacts with the sulfur that has been oxidized (SO_2) to form $CaSO_4$. Calcium sulfate or gypsum is chemically stable in the fluidized bed and is removed from the bed or downstream in the fabric filter baghouse as a solid. In addition to the control achieved through limestone injection directly into the CFB, LBEC also proposes a polishing scrubber to enhance the reductions of SO_2 emissions as well as other acid gases (HCl, HF, and H_2SO_4.).

LBEC maintains that the direct limestone injection in the CFB boiler will achieve an SO_2 emissions reduction of 98% and therefore satisfy BACT requirements.

6.1.3 CO Emissions

Carbon monoxide emissions are minimized through ideal combustion practices including high temperatures, adequate excess air and residence time, and optimal fuel/air mixing during combustion. Therefore, the emission reduction option proposed to mitigate CO emissions from the CFB boilers is the application of good combustion practices, including the use of combustion controls that optimize the design, operation, and maintenance of the furnace and combustion system. The furnace/combustion system design on modern CFB boilers provides the operating environment required to facilitate complete combustion. The CFB design, in particular, provides for continuous mixing of air and fuel in the proper proportions, extended residence time, and consistent temperatures in the combustion chamber. As a result, the designed furnace/ combustion system will limit CO formation by maintaining the optimum furnace temperature and amount of excess oxygen. LBEC maintains that the CFB design and the use of good combustion practices satisfy BACT requirements of 0.15 lb/MMBTU on a short-term and annual basis.

6.1.4 VOC Emissions

Similar to CO, VOC emissions are minimized through ideal combustion practices including high temperatures, adequate excess air and residence time, and optimal fuel/air mixing during combustion. Therefore, the emission reduction option proposed to mitigate VOC emissions from the CFB boilers is the application of good combustion practices, including the use of combustion controls that optimize the design, operation, and maintenance of the furnace and combustion system. The furnace/combustion system design on modern CFB boilers provides the operating environment required to facilitate complete combustion. The CFB design, in particular, provides for continuous mixing of air and fuel in the proper proportions, extended residence time, and consistent temperatures in the combustion chamber. LBEC maintains that the CFB design and the use of good combustion practices satisfy BACT requirements 0.005 lb/MMBTU on a short-term and annual basis.

6.1.5 PM/PM_{10} Emissions

Particulate emissions may be categorized as either filterable particulate matter or condensable particulate matter. Filterable PM, made up of solid and liquid particles that can be captured on the filter of a stack test train and chemical species that form in the atmosphere as the stack gas is cooled and diluted after it exits the stack, is generated by a variety of mechanisms including: (a) inorganic material within the fuel, (b) incomplete combustion and agglomeration of unburned fuel particles, (c) inorganic materials contained in the sorbent material (limestone) that are entrained in the combustion air, and (d) high temperature oxidation of trace metals. Condensable PM is that material that is in the vapor phase at stack conditions, but which quickly condenses and/or reacts upon cooling and dilution in the ambient air to form solid or liquid PM after discharge from the stack. Condensable PM may include aerosols (such as H_2SO_4), a range of volatile organic compounds, and ammonia or possibly some ammonium salts.

Generation of PM_{10} can be minimized by maximizing the residence time, providing sufficiently high combustion temperatures, and selecting fuels with high organic content. The design of a CFB boiler is inherently a PM_{10} control device because the long fuel residence time of CFB boilers allows for more complete combustion of organic material with corresponding decrease in the amount of the PM_{10} emitted. Filterable PM from solid fuel combustion sources is controlled using either fabric filters (also called baghouses) or an electrostatic precipitator (ESP). These types of PM/PM_{10} emission control devices are based on well-established technologies. Of these two types of equipment, fabric filters are the most effective means of controlling filterable PM/PM_{10} emissions from CFB units.

Since, condensable PM does not form within the combustion process itself; there is no direct control technology for it. The fabric filter may help to reduce the amount of reactants that can eventually form condensable PM; however, the system itself does not remove condensable PM from the gas stream. Instead, the system reduces the potential for condensable PM formation by reducing sulfuric acid mist emissions by reacting SO_3 with the lime so it can be removed with a fabric filter.

LBEC maintains that the CFB boiler design and installation of a fabric filter system satisfy the current BACT requirements for PM/PM_{10} emissions, including lead. In addition, this combination of emission controls is also determined to be BACT for emissions of metallic HAPs. As a result, LBEC maintains that achieving a filterable PM_{10} emission limitation of 0.015 lb/MMBTU on a short-term and annual basis meets BACT requirements.

6.1.6 H_2SO_4 Emissions

Similar to SO_2, H_2SO_4 emissions are minimized by the CFB boiler design and through the direct limestone injection in the CFB boiler. As previously mentioned, LBEC also proposes a polishing scrubber to enhance the reductions of SO_2 emissions as well as other acid gases (HCl, HF, and H_2SO_4). LBEC maintains that the CFB boiler design and limestone injection along with the polishing scrubber will achieve an H_2SO_4 emissions reduction of 90% and therefore satisfy BACT requirements.

6.1.7 HCl and HF Emissions

Combustion of fossil fuels also result in emissions of chlorine and fluorine, primary in the form of HCl and HF as a result of oxidation of trace concentration of chlorine and fluorine present in fossil fuels. It is expected that some of emission will be controlled by the limestone injection into the boiler. Moreover, these acid gases are highly reactive hydrophilic and readily controlled by acid gas scrubbing systems. As previously mentioned, LBEC also proposes a polishing scrubber to enhance the reductions of SO_2 emissions as well as other acid gases (HCl, HF, and H_2SO_4). LBEC maintains that the CFB boiler design and limestone injection along with the polishing scrubber will achieve an emissions reduction of 95% for HCl and HF and therefore satisfy BACT requirements.

6.1.8 Pb Emissions

Lead is emitted in the form of particulate matter. Therefore, it will also be controlled by the CFB design and fabric filters. As previously stated, LBEC maintains that the CFB boiler design and installation of a fabric filter system satisfy the BACT requirements for PM/PM_{10} emissions, including lead.

6.1.9 Hg Emissions

The reduced operating temperature associated with a CFB boiler design and the SO_2 control system provides more opportunity to condense mercury compounds and allows collection to take place. The flue gas temperature for the CFB boilers is projected to be in the range of 150 to 160°F compared to a typical flue gas temperature for a pulverized coal boiler of around 300°F. This reduced flue gas temperature is expected to result in mercury being emitted more as a particle and less as a gas, thereby considerably enhancing mercury control/capture by PM/PM_{10} controls.

Besides the inherent control of mercury by the CFB boiler technology, the control technologies proposed for SO_2 and PM/PM_{10} emissions have the added benefits of removing mercury from the flue gas through direct absorption, collection, and scrubbing. The removal of mercury from the flue gas is highly dependent on the speciation of mercury. Mercury in flue gas is either in elemental form (gaseous) or oxidized form (gaseous and particulate). Mercury in the particulate (oxidized) form is collected very efficiently by fabric filters. Also, there is some absorption of gaseous elemental mercury by fabric filters.

Finally, in order to further reduce mercury emissions, LBEC may require the use of activated carbon injection to the exhaust gas. In the event that it necessary, LBEC will construct four activated carbon injection silos (one for each boiler).

LBEC maintains that the CFB design and add-on controls for SO_2 (i.e., limestone injection in the CFB boiler), PM/PM_{10} (i.e., fabric filter), and the use of activated carbon as necessary will achieve an emission limit of 3.0×10^{-6} lb/MMBtu (as listed in the previously proposed MACT – 40 CFR§63, Subpart DDDDD) and therefore satisfy BACT requirements.

6.1.10 NH_3 Emissions

NH_3 emissions will be limited through the use of operational instrumentation systems to limit the NH_3 injection rate such that the annual NH_3 slip from the SNCR system will be less than 5 ppmv (dry, corrected to 3% oxygen). LBEC maintains that the use of the operational control systems satisfy BACT requirements.

6.1.11 Start-Up Emissions

LBEC will utilize a Good Engineering Practice (GEP) / Best Management Practice (BMP) Standard to limit start-up emissions associated with the CFB boilers. LBEC maintains that the use of the GEP/BMP Standard satisfy BACT requirements. This includes initiating startup with natural gas and minimizing the length of time to achieve steady-state operations.

6.2 Auxiliary Boilers

This section addresses BACT requirements for the auxiliary boilers. The boilers will meet the TCEQ established BACT guidelines for natural gas fired boilers operating on a limited basis as follows:

- CO – 100 ppmv corrected to three percent oxygen
- NOx – 0.035 pounds per million BTU
- SO2 – Combustion of low sulfur fuels
- PM – Good combustion operating practices; combustion of low sulfur fuels
- VOC - Good combustion operating practices

Accordingly, LBEC will use low-NO_x burners in the boilers to limit NO_x emissions to 0.035 pounds per MMBtu when burning natural gas. Limiting the sulfur content of the natural gas to 5 gr/ 100 scf will minimize SO_2 emissions from the boilers.

Particulate matter emissions will be minimized by using natural gas and efficient combustion technology in the boilers. The low solids content of the natural gas will result in insignificant emissions of particulates from the boilers. CO and VOC emissions from the boilers will be minimized by employing efficient combustion technology.

6.3 Propane Vaporizers

This section addresses BACT requirements for the propane vaporizers. The vaporizers will meet the TCEQ established BACT guidelines for natural gas fired combustions sources (<40 MMBTU/hr and otherwise qualifying for permit-by-rule) and operating on a limited basis as follows:

- CO – 100 ppmv corrected to three percent oxygen

- NOx – 0.1 pounds per million BTU
- SO2 – Combustion of low sulfur fuels
- PM – Good combustion operating practices; combustion of low sulfur fuels
- VOC - Good combustion operating practices

Accordingly, LBEC will use low-NO_x burners in the vaporizers to limit NO_x emissions to 0.035 pounds per MMBtu when burning natural gas. Limiting the sulfur content of the natural gas to 5 gr/ 100 scf will minimize SO_2 emissions from the vaporizers.

Particulate matter emissions will be minimized by using natural gas and efficient combustion technology in the vaporizers. The low solids content of the natural gas will result in insignificant emissions of particulates from the vaporizers. CO and VOC emissions from the vaporizers will be minimized by employing efficient combustion technology.

6.4 Material Handling Facilities

LBEC will utilize LBTC for a significant portion of material handling activities. Figure 4-1 provides a general material handling process flow diagram that details which activities are included in this permit application vs. those activities being authorized by LBTC. The following is a BACT analysis for the material handling activities included in this permit application.

6.4.1 Pet Coke

Pet coke will be reclaimed by conveyors from the LBTC stockpiles to twenty storage silos. Each CFB boiler is equipped with five storage silos that share a common fabric filter system that consists of two fabric filters to provide a high level of particulate emission control. LBEC maintains that the use of enclosed conveyor systems and fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.2 Limestone

Limestone will be reclaimed by conveyors from the LBTC stockpiles to four storage bunkers. Each CFB boiler limestone bunker is equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of enclosed conveyor systems and fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.3 Lime

Lime will be unloaded pneumatically from trucks into nine storage silos. Each storage silo is equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.4 Soda Ash

Soda ash will be unloaded pneumatically from trucks into one storage silos. The storage silo will be equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.5 Sand

Sand will be unloaded pneumatically from trucks into one of four day bins. Each day-bin will be equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.6 Fly Ash

Fly ash will collected from each CFB fabric filter and pneumatically transferred four storage silos. Each storage silo is equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.7 Bottom Ash

Bottom ash will be pneumatically transferred from the boilers through a cooling stage into four storage silos. Each storage silo is equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.4.8 Activated Carbon

Activated carbon will be pneumatically transferred from the boilers through a cooling stage into four storage silos. Each storage silo is equipped with a fabric filter to provide a high level of particulate emission control. LBEC maintains that the use of fabric filters with an outlet grain loading rate of 0.01 gr/dscf satisfy BACT requirements.

6.5 Diesel-Fired Emergency Generators

Combustion emissions from the diesel fired emergency generators will only occur in the event of an emergency or unscheduled event or possibly during startup. BACT for these types of emergency-related equipment are typically satisfied by restricting the number of hours these sources operate during the year. LBEC maintains that the limited number of annual operating hours (< 500 hrs/yr) and use of low sulfur diesel (< 500 ppm) satisfy BACT requirements.

6.6 Diesel-Fired Fire Water Pumps

Combustion emissions from the diesel fired water pumps will only occur in the event of an emergency or unscheduled event or possibly during startup. BACT for these types of emergency-related equipment are typically satisfied by restricting the number of hours these sources operate during the year. LBEC maintains that the limited number of annual operating hours (< 500 hrs/yr) and use of low sulfur diesel (< 500 ppm) satisfy BACT requirements.

6.7 Diesel-Fired Boiler Feed Water Pumps

Combustion emissions from the diesel-fired feed water pumps will only occur in the event of an emergency or unscheduled event or possibly during startup. BACT for these types of emergency-related equipment are typically satisfied by restricting the number of hours these sources operate during the year. LBEC maintains that the limited number of annual operating hours (< 500 hrs/yr) and use of low sulfur diesel (< 500 ppm) satisfy BACT requirements.

6.8 Storage Tanks

The fixed roof storage tanks included in this permit application are submerged filled and each have a storage capacity of less than 25,000 gallons and store materials with a vapor pressure less than 0.5 psia.; therefore, satisfy BACT requirements. The anhydrous ammonia storage tanks are pressure tanks and should not have any emissions during normal operations.

6.9 Fugitive Emissions

Emissions are also generated from potentially leaking process equipment in natural gas and ammonia service. These fugitive emissions were estimated using TCEQ recommended factors. Because the proposed facility will have a small number of pumps, valves, flanges, etc. in VOC service and the proposed emissions without taking credit for any leak detection and repair (LDAR) program are minimal, an LDAR program would not result in a significant emissions decrease. In addition, TCEQ guidance suggests that an LDAR Program is not required when uncontrolled VOC emissions are less than 10 tpy. As such, LBEC proposes that BACT for VOC fugitive emissions does not include an LDAR program.

An Audio/Visual/Olfactory (AVO) LDAR program will be used to monitor fugitive components in NH_3 service associated with the SNCR on each CFB. The AVO LDAR program is BACT for units with potentially odorous compounds.

6.10 Cooling Towers

PM emissions from cooling tower water droplet drift can be minimized by limiting either the amount of drift or the level of dissolved solids in the water. Dissolved solids build up in the recirculating water as a result of the evaporation that occurs in the cooling tower and must be limited to prevent scaling problems in the cooling tower. This is done by blowing down a portion of the water and adding makeup water that is low in dissolved solids. Water availability, conservation and cost considerations impose limits on the amount of makeup water that can be used. These factors limit the degree to which particulate emissions from drift can be controlled by reducing the dissolved solids concentration in the water. The drift rate, expressed as a percent of the recirculation rate, can be minimized through cooling tower design and the use of mist eliminators. Both technologies will be utilized on the cooling towers to limit drift to 0.0005% of the recirculation rate. No additional technologies are available for drift control; therefore, this design is proposed as BACT.

Section 7
PAL Emissions Cap Compliance Methodology

Plantwide Applicability Limits (PALs) for each pollutant, calculated as the sum of the individual emissions rates from each of the emissions points presented in this section, are presented in Table A-1. These PALs are the proposed annual emissions limits to be included in the maximum allowable emission rate table. Future physical changes and changes in the method of operation are allowed without triggering an additional PSD review provided these limits are not exceeded. Addition of new facilities will require state-only NSR authorization from TCEQ.

This section of the permit application includes a discussion of how LBEC will demonstrate compliance with each PAL, including both the methods used to calculate actual site-wide emissions and monitoring and recordkeeping to support the calculations. Compliance with each PAL will be demonstrated on a rolling 12-month basis.

7.1 NO_x Emissions

The CFB boilers at the LBEC Plant will be equipped with NOx CEMs as required by the Acid Rain Program. Total emissions for each month as reported to EPA for Acid Rain purposes will be used for each of these units in the cap compliance demonstration.

Other sources of NO_x at the plant include emergency generators and fire water pumps. Emissions from these sources will be based on monthly fuel usage for each unit and AP-42 fuel-based emission factors.

7.2 SO_2 Emissions

The CFB boilers at the LBEC Plant will be equipped with SO_2 CEMs as required by the Acid Rain Program. Total emissions for each month as reported to EPA for Acid Rain purposes will be used for each of these units in the cap compliance demonstration.

Other sources of SO_2 at the plant include emergency generators and fire water pumps. Emissions from these sources will be based on monthly fuel usage for each unit and AP-42 fuel-based emission factors.

7.3 CO Emissions

The CFB boilers at the LBEC Plant will be equipped with CO CEMs. Total emissions for each month will be used for each of these units in the cap compliance demonstration.

For the emergency generators and fire water pumps, CO emission rates will be calculated from monthly fuel usage rates and AP-42 fuel-based emission factors.

7.4 VOC Emissions

Monthly VOC emissions from the CFB boilers will be calculated from monthly fuel firing rates and fuel-based emission factors. Monthly fuel firing rates will be determined from pet coke totalizers and fuel flow meters and converted to mmbtu as necessary using measured fuel heating values as described previously for the SO_2 and PM/PM_{10} emissions calculations. For natural gas firing, AP-42 emission factors will be used in the emissions calculations. For pet coke firing, VOC emission factors, in lb/MMBtu, will be used in the emissions calculations.

For the emergency generators and fire water pumps, VOC emission rates will be calculated from monthly fuel usage rates and AP-42 fuel-based emission factors.

Monthly VOC emissions from the storage tanks will be calculated using the currently approved version of the EPA Tanks program and actual monthly tank throughput data. Physical characteristics (vapor pressure and molecular weight) of the materials will be based on the best available data, which may include representative published data, fuel supplier data, and/or actual analysis of the material stored in each tank.

7.5 PM/PM_{10} Emissions

For the CFB boilers, actual monthly emissions of PM/PM_{10} for PAL compliance demonstration will be calculated by multiplying fuel-based emission factors (lb/MMBtu) determined by performance testing by the total fuel fired (mmbtu) in each boiler for the month. It will be conservatively assumed that all of the PM will be emitted as PM_{10} for the CFB boilers. The factors will include both front and back half particulate fractions. The total monthly pet coke usage in tons is measured using pet coke totalizers on each boiler. The monthly pet coke usage (lb) is then multiplied by the heating value of the pet coke (btu/lb). A monthly average pet coke heating value is obtained by averaging the pet coke heating values from each pet coke shipment. The average heating value of each pet coke shipment is provided to LBEC by the pet coke supplier. Fuel oil and natural gas are used only for startup. AP-42 emission factors will be used to calculate PM/PM_{10} emissions for both natural gas firing in the CFB boilers. Emission factors in lb per unit of fuel used will be multiplied by the monthly fuel usage rate as measured by fuel flow meters.

For the emergency generators and fire water pumps, PM emission rates will be calculated from monthly fuel usage rates and AP-42 fuel-based emission factors. It will be conservatively assumed that all of the PM will be emitted as PM_{10}.

PM and PM_{10} emission rates from materials handling will be calculated by multiplying the emission factor used as the basis of the NSR permit limit for each EPN by the total monthly throughput for the EPN. Where readily available, monthly throughputs will be actual throughputs obtained from plant operating records. Otherwise, the throughput used for the calculation will be assumed to be equal to the permitted maximum rate.

PM and PM_{10} emission rates from the cooling towers will be based on the assumption included in Table A-12 of the permit application including assumption on the distribution of $PM_{2.5}$.

7.6 H_2SO_4 Emissions

Monthly emissions of H_2SO_4 will be calculated from pet coke combustion in the CFB boilers and using fuel usage rates in MMBtu and emission factors in lb/MMBtu as determined during performance testing.. Fuel usage rates in MMBtu will be determined from pet coke totalizers and the average heating value of the pet coke as described above for the calculation of PM /PM_{10} emissions.

H_2SO_4 emissions from minor combustion sources, including emergency generators and fire water pumps are zero to negligible and are thus not quantified by LBEC and will not be considered in assessing compliance with the PAL.

7.7 Recordkeeping

LBEC will maintain records of all monitoring data, operating parameters, and any other supporting data used in the calculations described in this section at the LBEC Plant for a period of 5 years.

Section 8
Permit Application Fee

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

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

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

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

I. DIRECT COSTS [30 TAC § 116.141(c)(1)]	**Estimated Capital Cost**
A. A process and control equipment not previously owned by the applicant and not currently authorized under this chapter	> $7,500,000
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	> $7,500,000

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

Company Name: Las Brisas Energy Center, LLC

Company Representative Name (please print): [illegible] Title: Managing Partner

Company Representative Signature: [signature]

Estimated Capital Cost		Permit Application Fee	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)

PERMIT APPLICATION FEE (from table above) = $ 75,000 Date: 5/16/2008

ORIGINAL DOCUMENT HAS A SECURITY VOID BACKGROUND PANTOGRAPH, MICROPRINTED BORDER - SEE REVERSE SIDE FOR COMPLETE SECURITY FEATURES.

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7344 Louetta Road
Spring, Texas 77379

001033

DATE 5/13/2008

PAY TO THE ORDER OF Texas Department of Environmental Quality $ **75,000.00

Seventy-Five Thousand and 00/100*** DOLLARS

Texas Department of Environmental Quality

Security Features Included. Details on Back

Memo
Las Brisas Energy Center

AUTHORIZED SIGNATURE

⑆111015159⑆ 2000037566968⑈ 1033

Chase Power Development LLC **001033**

Texas Department of Environmental Quality 5/13/2008 75,000.00

Wachovia Las Brisas Energy Center 75,000.00

Chase Power Development LLC **001033**

Texas Department of Environmental Quality 5/13/2008 75,000.00

Wachovia Las Brisas Energy Center 75,000.00

Section 9
Prevention of Significant Deterioration Review

The project emissions were used to determine if the proposed project is subject to Federal Prevention of Significant Deterioration (PSD) permitting requirements. The facility will be located in Nueces County, which is designated as attainment for all pollutants. The proposed electrical generating facility is subject to PSD review for NO_x, ozone (VOC), CO, SO_2, H_2SO_4, and PM/$PM_{10,}$ particulate matter less than 2.5 microns ($PM_{2.5}$) Form PSD-1 is included at the end of the section.

9.1 Air Quality Monitoring Requirements

PSD regulations require collection of up to one year of pre-construction ambient air quality monitoring data for each pollutant subject to PSD review unless the air quality impacts from the proposed source or modification are shown to be *de minimis.* The PSD regulations contain *de minimis* levels for each pollutant. The air quality impact analysis, which will be submitted separately from this application, is expected to demonstrate that the project is exempt from pre-construction monitoring for these pollutants. The report documenting the modeling analysis will verify this assumption. In the event that de minimis pre-construction monitoring levels are exceeded, representative ambient monitoring data from existing nearby monitors may be used in lieu of pre-construction monitoring.

9.2 Air Quality Modeling Requirements

An air quality modeling analysis is required to demonstrate the proposed emissions will not cause or contribute to a violation of any National Ambient Air Quality Standard (NAAQS) or PSD increment for pollutants subject to PSD review (NO_x, VOC, CO, SO_2, H_2SO_4, and PM/PM_{10}). The TCEQ may also require a demonstration of compliance with the NAAQS and TCEQ property line standards for other pollutants. Modeling will be performed based on guidance from the TCEQ permit engineer during application review. The results of these analyses will be submitted to the TCEQ in a separate document.

9.3 Additional Impacts Analysis

Federal PSD regulations require an analysis of the emissions impact from the proposed project on soils and vegetation, visibility, and associated growth. These analyses will be performed concurrently with the air quality analysis, and the results will be included in the air quality analysis report.

RPS JDC

Texas Natural Resource Conservation Commission
Prevention of Significant Deterioration (PSD) Review

TABLE PSD-1
PSD AIR QUALITY APPLICABILITY SUPPLEMENT

TO BE COMPLETED BY APPLICANT AT TIME OF APPLICATION

A permit applicant must complete this table if PSD netting is required or if requested by permit engineer. This is not a stand-alone document. Please refer to the TNRCC *PSD Air Quality Guidance Document* for specific details regarding information required by this form. For additional information regarding PSD applicability and review, please refer to 40 CFR Part 52 Section 21 and EPA's Draft *New Source Review Workshop Manual* of October 1990 which provides examples for illustration.

Permit Application No. TBD

Company : Las Brisas Energy Center, LLC TCEQ Air Quality Account I.D. TBD

Company Contact: Mr. John Upchurch Phone Number : 281-636-2017

Facility Location or Street Address on the Joe Fulton Corridor bordering the west side of the Port of Corpus Christi Bulk Terminal

City : Corpus Christi County: Nueces

Permitted Unit I.D. and Name Various

Permit Activity: X New Major Source ☐ Major Modification

Project or Process Description Four pet coke fired steam electric generating units and support facilities.

Operating Schedule: __hrs/day ______days/wk ______wks/hr 8760 hrs/yr

Continuous

Or throughput

The information provided on this form (and Tables PSD-2 and PSD-3, if applicable) is true and correct.

[signature] Managing Partner 5/16/2008

Signature Title Date

If Prevention of Significant Deterioration (PSD) review is required, then the applicant must send a complete application to EPA Region 6 at the address below. EPA Region 6 must also receive copies of all subsequent correspondence.

EPA Region 6
New Source Review Section
1445 Ross Avenue
Dallas, TX 75202-2733

LIST RELEVANT DATES:

A.	06/01/2009	Estimated start of construction.
B.	06/01/2004	5 years prior to estimated start of construction.
C.	11/01/2012	Estimated start of operation.

DEFINE CONTEMPORANEOUS PERIOD (from B to C): 06/01/2004 to 11/01/2012
From 5 years prior to estimated start of construction through estimated start of operation.

03/97

	Yes	No	Regulated Pollutant[1]						
			NO_x	SO_2	CO	Ozone	$PMPM_{10}$	H_2SO_4	Pb
Existing site potential to emit[2] (tpy)			NA	NA	NA	NA	NA	NA	NA
Proposed project increases[2] (tpy)			3,823.8	10,480.3	8,154.2	283.0	3,004.0/ 2,901.4	1,996.6	0.1
Nonattainment New Source Review Applicability: If the proposed project will be located in an area that is designated nonattainment for any pollutants, place a check to the right in the column under that pollutant(s) and complete a Table 1N.									
Is the existing site one of the 28 named sources?[3]	X								
Is the existing site a major source?[4]	X								
Existing site is a major source:									
Is netting required? If "Yes" attach Tables PSD-2 and PSD-3.[5]	NA								
Significance level as defined in 40 CFR 52.21(b)(23)[6]			40	40	100	40	25/15	7	0.6
Net contemporaneous change from Table PSD-2 (tpy)			NA	NA	NA	NA	NA	NA	NA
Is PSD review applicable? Answer "Yes" or "No" under each applicable pollutant.			Yes	Yes	Yes	Yes	Yes	Yes	No
Existing site is NOT a major source:									
Is the proposed project by itself one of the 28 named sources[3]	X								
Is the proposed project a major source by itself? (No consideration is given to any emissions decreases.)[4]	X								
Once the project is considered major all other pollutants are compared to their respective significance levels.[6] Netting is not allowed. **Is PSD review applicable?** Answer "Yes" or "No" under each applicable pollutant.									

1 Regulated pollutants include criteria pollutants (pollutants for which a National Ambient Air Quality Standard [NAAQS] exists) and noncriteria pollutants (pollutants regulated by EPA for which no NAAQS exists).
2 Defined in Part A of the TNRCC *PSD Air Quality Guidance Document*.
3 The 28 named source categories are listed in 40 CFR 52.21(b)(1) and Table A of the TNRCC *PSD Air Quality Guidance Document*.
4 Refer to Part C "major source determination" of the TNRCC *PSD Air Quality Guidance Document.*
5 Refer to Part E2 of the TNRCC *PSD Air Quality Guidance Document.*
6 Significant emissions are defined in 40 CFR 52.21(b)(23) and Table B of the TNRCC *PSD Air Quality Guidance Document*.

Section 10
General Application Requirements

30 TAC §116.111 and 30 TAC §116.182 specify the general application requirements for permit applications. This section addresses each of those requirements.

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

The emissions from the facilities comply with all air quality rules and regulations and with the intent of the TCAA, including protection of public health and welfare. Applicable regulations for LBEC are as follows:

10.1.1 Chapter 101 - General Air Quality Rules

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

10.1.2 Chapter 106 – Permits by Rule

The LEBC facility does not plan to use permits by rule at this time.

10.1.3 Chapter 111 –Visible Emissions and Particulate Matter

The LEBC facility is subject to and will operate in compliance with all requirements of 30 TAC Chapter 111.

10.1.4 Chapter 112 - Sulfur Compounds

The LEBC facility is subject to and will operate in compliance with all requirements of 30 TAC Chapter 112.

10.1.5 Chapter 113 – Toxic Materials

This chapter references the regulations under 40 CFR Part 63. Applicability for those regulations is addressed in Section 10.5.

10.1.6 Chapter 114 – Motor Vehicles

The LEBC facility is subject to and will operate in compliance with all requirements of 30 TAC Chapter 114.

10.1.7 Chapter 115 - Volatile Organic Compounds (VOC)

The LEBC facility is subject to and will operate in compliance with the following subchapters of 30 TAC Chapter 115:

Subchapter B, Division 1, Storage of VOC

Subchapter C, Division 1, Loading and Unloading of VOC

10.1.8 Chapter 116 – New Construction or Modification

The LBEC facility will operate in compliance under multiple new source review authorizations.

10.1.9 Chapter 117 - Nitrogen Compounds

The LBEC facility is not subject to the requirements of 30 TAC Chapter 117.

10.1.10 Chapter 118 – Air Pollution Episodes

The LBEC facility will operate in compliance with all requirements of 30 TAC Chapter 118.

10.1.11 Chapter 122 – Federal Operating Permits

The LBEC facility is subject to and will operate in compliance with the requirements of 30 TAC Chapter 122. LEBC will submit a Title V permit application and acid rain permit application under separate cover and at the appropriate time.

10.1.12 Impact on Schools

There are no schools located within 3,000 feet of the affected facilities.

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

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

10.3 BACT Technology - 30 TAC § 116. 111(a)(2)(C)

Section 6 of this application provides a detailed best available control technology analysis.

10.4 NSPS - 30 TAC § 116. 111(a)(2)(D)

The LBEC facility is subject to, and will operate in compliance with, the following New Source Performance Standards:

40 CFR Part 60, Subpart A	General Provisions
40 CFR Part 60, Subpart Da	Standards of Performance for Electric Utility Steam Generating Units for which Construction is Commenced After September 18, 1978
40 CFR Part 60, Subpart Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units
40 CFR Part 60, Subpart OOO	Standards of Performance for Nonmetallic Mineral Processing Plants
40 CFR Part 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

10.5 NESHAP - 30 TAC § 116.111(a)(2)(E) and § 116.111(a)(2)(F)

The facility is subject to, and will operate in compliance with, the following National Emission Standards for Hazardous Air Pollutants:

40 CFR Part 63, Subpart A	NESHAP for Source Categories - General Provisions
40 CFR Part 63, Subpart ZZZZ	NESHAP for Stationary Reciprocating Internal Combustion Engines

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

This facility will perform as represented in the application and as required by the permit.

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

Nueces County is designated attainment/unclassified for all criteria pollutants; therefore, NNSR permitting is not required.

10.8 PSD Review – 30 TAC § 116.111(a)(2)(I)

Nueces County is an attainment area for Ozone, NO_2, CO, PM/PM_{10}/$PM_{2.5}$ and SO_2. H_2S, for which there is no NAAQS, is also regulated by the PSD program. The emissions associated with this project do constitute a new major source; therefore, PSD review is required. See Section 9 for a detailed PSD analysis.

10.9 Air Dispersion Modeling – 30 TAC § 116.111(a)(2)(J)

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

10.10 HAP – 30 TAC § 116.111(a)(2)(K)

The LBEC CFB boilers and Auxiliary boilers are not subject to any existing MACT standards; therefore, may likely be an affected source subject to the requirements of FCAA 112(g) or 112(j). LBEC recognizes that the vacatur of the Clean Air Mercury Rule, along with the absence of a source category MACT standard, may now subject the proposed CFBs to the requirements for case-by-case MACT pursuant to FCAA 112(g).

In addition, LBEC also recognizes that the vacatur of the Boiler MACT (40 CFR Part 63, Subpart DDDDD), along with the absence of a source category MACT standard, may now subject the proposed Auxiliary Boilers to the requirements for case-by-case MACT pursuant to FCAA 112(g) and/or the MACT Hammer provisions of FCAA 112(j).

However, at this time LEBC is awaiting guidance from the Court, TCEQ, and EPA prior to submitting an application to establish a case-by-case MACT limit for the CFBs and/or a 112(j) determination for the Auxiliary Boilers.

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

The LBEC facility is not subject to the requirements of the Mass Emissions Cap and Trade (MECT) program.

10.12 PAL Facilities – 30 TAC § 116.182(a)(1)

The facilities included in each PAL are described in Section 7 of this permit application. The state and federal regulatory applicability analysis is included in this section.

10.13 PAL Emission Calculation Basis – 30 TAC § 116.182(a)(2)

The calculations procedures used to demonstrate establish each PAL are described in Section 7 of this permit application.

10.14 PAL Cap Compliance – 30 TAC 116.182(a)(3)

The calculations procedures used to demonstrate compliance with each PAL are described in Section 7 of this permit application.

10.15 PAL Monitoring and Recordkeeping – 30 TAC 116.182(a)(4)

The parameters to be monitored for use in PAL compliance demonstration calculations and the subsequent records to be kept are described in Section 7 of this permit application.

Section 11
Disaster Review

The SNCR systems that will be used for NO_x control at the Las Brisas Energy Center will utilize anhydrous ammonia. A disaster review is required by TCEQ if more than 10,000 lb (~1,750 gallons) of anhydrous ammonia is stored on site. Anhydrous ammonia will be stored in two ammonia storage bullets each with a nominal capacity of 10,000 gallons (~57,000 lb); therefore, a disaster review is required. The plant will also be subject to EPA Risk Management Plan (RMP) regulations and, as required by these rules, will prepare an RMP which will be kept on file at the plant. A completed copy of the Disaster Review Checklist is included.

RPS JDC

Disaster Review Checklist

1.0 PROCESS, CHEMICAL, AND SITE INFORMATION

1.1 Chemical name (per TCEQ Disaster Review Guidance[1]):
Ammonia anhydrous

1.2 Total quantity in process:
Approximately 500 gallons (2,800 lbs)
Maximum 20,000 gallons (114,000 lbs) maximum in 2 storage tanks

1.3 Phase at ambient temperature (77°F):
liquid ____ gas __X__

1.4 Concentration of chemical in mixture
99.5 wt%

1.5 Liquid vapor pressure (or partial pressure in mixture) at ambient temperature:
157 psia

1.6 Approximate distance to nearest EPA-defined receptor[2]
To be determined.

1.7 Non-owned property within 1 mile of site (check all that apply):
industrial ___X__ residential __X__ commercial __X__ rural __X__

1.8 Federal regulatory applicability for new Disaster Review chemical:

29 CFT 1910.119, OSHA *Process Safety Management* (PSM) Standard: **Yes**

40 CFR Part 68, EPA *Risk Management Program* (RMP) Rule: **Yes**

1.9 Does the facility have an EPA Risk Management Plan (RMP) on file for other chemical(s) that are subject to the RMP rule? **No, new facility**

Facility Name as given in RMP Checklist item 1.1a:

EPA Facility Identifier for RMP

[1] Technical Package for: NSRPD Disaster Review, TCEQ Air Permits Division, January 2001 (Draft).
[2] EPA-defined receptors include "off-site residences, institutions (e.g., schools and hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source…"

Note: The existing RMP can be accessed at http://www.epa.gov/ceppo using RMP* Info. The plan will provide useful information regarding prevention and emergency response policies and practices at the site.

2.0 WORST CASE RELEASE SCENARIO AND RECEPTOR ANALYSIS

Note: The worst-case scenario (WCS) involves an immediate or near-immediate loss of the entire contents of the single largest chemical storage vessel or pipe. Per EPA definitions[3], the WCS for a toxic chemical that is a gas at ambient temperature (such as anhydrous ammonia) is the complete loss of inventory as a gas over ten minutes. Worst-case meteorological conditions must be assumed (a stable, Class F atmosphere and low winds of 1.5 m/s). The WCS has the potential to produce off site impacts if airborne concentrations greater than or equal to the EPA toxic endpoint concentration (200 ppm for ammonia) could be experienced at an off site receptor as defined in Section 1.6 above.

Further guidance on estimating the potential for WCS off site impacts can be found within EPA's *Risk Management Program Guidance of Offsite Consequence Analysis* and its companion software, RMP* Comp. Both are available for download at http://www.epa.gov/ceppo.

Could a worst-case chemical release scenario produce off site impacts?

____ No; Complete and submit Section 1.0 and 2.0
_**X**_ Yes; Complete and submit Sections 1.0, 2.0, and 3.0

3.0 PREVENTION AND EMERGENCY RESPONSE PROGRAMS

Note: Depending on applicability to federal regulations (the PSM Standard and RMP Rule), complete process hazard analyses, process safety and risk management programs and supporting documentation will need to be developed and submitted prior to initial delivery of the regulated chemical. For those facilities already subject to PSM and/or RMP, updates will be required to accommodate the new chemical.

The following information is required for the TCEQ Disaster Review at the time of the permit application. Provide information only as it pertains to the New Disaster Review chemical.

3.1 Applicable Chemical Storage and Handling Standards

OSHA 29 CFR 1910.111
ASTM standards
ASME standards
ANSI standards

[3] 40 CFR Part 68 – Chemical Accident Prevention Provisions, Subpart B – Hazard Assessment.

3.2 Process Controls to be Applied

____ Vents
____ Scrubbers
_X__ Check Valves
_X__ Interlocks
____ Purge system
_X__ Relief valves
____ Flares
_X__ Manual shutoffs
____ Keyed bypass
____ Rupture disks
____ Emergency air supply
____ Emergency power
_X__ Automatic shutoffs
_X__ Grounding equipment
____ Excess flow device

3.3 Mitigation Systems to be Applied

____ Sprinkler system
____ Enclosures
____ Deluge system
____ Water curtain
____ Fire walls
____ Neutralization
_X__ Dikes
____ Blast walls
_X__ Other (specify)
Fire monitors set up around storage tank dike to knock down NH3 vapors.

3.4 Monitoring/Detection Systems to be Applied

_X__ Process area detectors
____ None
____ Perimeter monitors
____ Other (specify)

3.5 Emergency Response (ER) Plan

3.5.1 Is the facility included in a written community ER plan? **No**
If not, will it be incorporated into the community plan prior to introducing the New Disaster Review chemical? **Yes**

3.5.2 Does the facility have its own written ER Plan which will be updated prior to delivery of the chemical on site? **No**

3.5.3 Does or will the facility ER Plan include procedures for informing the public and local agencies responding to accidental releases? **Yes**

3.5.4 Does or will the facility ER Plan include information on emergency health care? **Yes**

3.5.5 Does the facility ER program include training and drills for facility employees (both responders and non-responders)? **Yes**

Appendix A

Emission Calculations Details

Index to Calculation Tables

Las Brisas Energy Center, LLC

Table A-1. Sitewide Emission Summary

Las Brisas Energy Center, LLC

Maximum Short-term Emission Summary (lb/hr)

Source Type	NOx	CO	VOC	PM	PM10	SO_2	H_2SO_4	Ammonia	HCl	HF	Mercury	Lead
CFBs	1232.0	1848.0	61.6	726.9	726.9	2857.0	455.8	64.2	54.6	4.72	0.04	0.16
Material Handlining				29.3	29.3							
Cooling Towers				24.02	0.59							
Engines	106.54	76.78	24.57	4.10	4.10	2.67	0.21					
Tanks			0.11				0.16					
Boilers/Heaters	15.80	32.64	2.09	2.97	2.97	0.24						
Piping Fugitives			1.02					0.21				
Total	**1,354.3**	**1,957.4**	**89.4**	**787.3**	**763.8**	**2,859.9**	**456.2**	**64.4**	**54.6**	**4.72**	**0.04**	**0.16**

Annual Emission Summary (tpy)

Source Type	NOx	CO	VOC	PM	PM10	SO_2	H_2SO_4	Ammonia	HCl	HF	Mercury	Lead
CFBs	3777.3	8094.2	269.8	2806.0	2806.0	10479.3	1996.6	140.5	47.9	4.40	0.16	0.10
Material Handlining				88.1	88.1							
Cooling Towers				105.20	2.57							
Engines	26.72	19.16	6.16	1.05	1.05	0.70	0.06					
Tanks			0.00				0.00					
Boilers/Heaters	19.75	40.80	2.62	3.71	3.71	0.30						
Piping Fugitives			4.45					0.91				
Total	**3,823.8**	**8,154.2**	**283.0**	**3004.0**	**2901.4**	**10,480.3**	**1996.6**	**141.4**	**47.9**	**4.40**	**0.16**	**0.10**
PSD Applicable	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**na**	**na**	**na**	**na**	**No**

Table A-2. Emission Factor Summary
Las Brisas Energy Center, LLC

Parameter	Value	Unit
Annual NOx Emission Rate	0.07	lb/MMBtu (HHV)
Maximum NOx Emission Rate	0.1	lb/MMBtu (HHV)
Annual NH3 Concentration at 3% O2	5	ppmvd
Maximum NH3 Concentration at 3% O2	10	ppmvd
Annual CO Emission Factor	0.15	lb/MMBtu (HHV)
Hourly CO Emission Factor	0.15	lb/MMBtu (HHV)
Annual VOC Emission Factor	0.005	lb/MMBtu (HHV)
Hourly VOC Emission Factor	0.005	lb/MMBtu (HHV)
Average Pet. Coke Sulfur %	6.7%	
Maximum Pet. Coke Sulfur %	8.0%	
Minimum SO2 Removal Efficiency	98%	
Average Controlled SO2 Emission Factor	0.1942	lb/MMBtu (HHV)
Maximum Controlled SO2 Emission Factor	0.2319	lb/MMBtu (HHV)
Minimum HCl and HF Removal Efficiency	95%	
Average HCl Emission Factor	8.87E-04	lb/MMBtu (HHV)
Average HF Emission Factor	8.15E-05	lb/MMBtu (HHV)
Fabric Filter Control Efficiency for Trace Metals	99%	
Average Lead Emission Factor	1.91E-06	lb/MMBtu (HHV)
Maximum Conversion of SO2 to SO3	2.5%	
Minimum H2SO4 Removal Efficiency	90%	
Average H2SO4 Emission Factor	0.037	lb/MMBtu (HHV)
Maximum H2SO4 Emission Factor	0.044	lb/MMBtu (HHV)
Hg Emissions	3.00E-06	lb/MMBtu
Filterable PM10 Emission Rate	0.015	lb/MMBtu (HHV)
Fabric Filter Outlet Grain Loading	0.01	grs/dscf
Cooling Tower Drift Eliminator Efficiency	0.0005%	
Auxillary Boiler NOx Emissions	0.035	lb/MMbtu
Propane Vaporizers NOx Emissions	0.1	lb/MMbtu

Table A-3. CFB Boiler Emission Summary

Las Brisas Energy Center, LLC

CFB Boiler Emission Summary																		
FIN	EPN	Name	NOx		CO		VOC		PM		SO_2		Ammonia		H_2SO_4	
			lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
CFB-1	CFB1&2	CFB Boiler 1	308.0	944.3	462.0	2023.6	15.4	67.5	181.7	701.5	714.3	2619.8	16.0	35.1	114.0	499.1
CFB-2	CFB1&2	CFB Boiler 2	308.0	944.3	462.0	2023.6	15.4	67.5	181.7	701.5	714.3	2619.8	16.0	35.1	114.0	499.1
CFB-3	CFB3&4	CFB Boiler 3	308.0	944.3	462.0	2023.6	15.4	67.5	181.7	701.5	714.3	2619.8	16.0	35.1	114.0	499.1
CFB-4	CFB3&4	CFB Boiler 4	308.0	944.3	462.0	2023.6	15.4	67.5	181.7	701.5	714.3	2619.8	16.0	35.1	114.0	499.1
		Total	1232.0	3,777.3	1848.0	8,094.2	61.6	269.8	726.9	2806.0	2857.0	10479.3	64.2	140.5	455.8	1996.6

Table A-4. CFB Parameters

Las Brisas Energy Center, LLC

Estimated CFB Performance		
Parameter	**Value**	**Unit**
FACILITY CONDITIONS		
Higher Heating Value of Pet Coke	13,800	Btu/lb
Maximum coke firing rate	112	ton/hr
Maximum coke firing rate	223,188	lb/hr
Gross Heat Input	3,080	MMBtu/hr
Maximum Coke Sulfur Content	8.0%	
Average Coke Sulfur Content	6.7%	
Minimum SO2 Removal Efficiency	98.0%	
Minimum HCl and HF Removal Efficiency	95.0%	
Minimum H2SO4 Removal Efficiency	90.0%	
Fabric Filter Control Efficiency for Trace Metals	99.0%	
Molar Volume at standard conditions (70F, 1atm)	387	ft^3/mol
Maximum Exhaust Flow Rate	1,311,606	scfm
Average Exhaust Flow Rate	1,311,606	scfm
Maximum Conversion of SO_2 to SO_3	2.5%	
Excess Air	25%	
Power Output (one CFB)	300,000	kW
Power Output (Four CFBs)	1,200,000	kW
Gross Plant Power Output	1,200,000	kW
Plant Auxiliary Loads	100,000	kW
Net Plant Power Output	1,100,000	kW
Exhaust Gas Flow Rate, wet per CFB	3,202,311	lb/hr
CFB Exhaust Gas Flow Rate, wet per CFB	106,970	lbmol/hr
CFB Exhaust Gas Flow Rate, dry per CFB	3,106,885	lb/hr
CFB Exhaust Gas Flow Rate, dry per CFB	101,675	lbmol/hr
CFB Exhaust Gas Flow Rate, dry at 3% O_2 per CFB	94,365	lbmol/hr
CFB Exhaust Temperature	175	°F
CFB EMISSIONS		
Post-SNCR NO_x		
Annual NOx Emission Rate	0.07	lb/MMBtu (HHV)
Maximum NOx Emission Rate	0.10	lb/MMBtu (HHV)
NH_3 Emissions		
Annual NH_3 Concentration in Flue Gas	4.6	ppmvd
Annual NH_3 Concentration at 3% O_2	5	ppmvd
Maximum NH_3 Concentration in Flue Gas	9.3	ppmvd
Maximum NH_3 Concentration at 3% O_2	10	ppmvd
CO Emissions		
Annual CO Emission Factor	0.15	lb/MMBtu (HHV)
Hourly CO Emission Factor	0.15	lb/MMBtu (HHV)
VOC Emissions		
Annual VOC Emission Factor	0.005	lb/MMBtu (HHV)
Hourly VOC Emission Factor	0.005	lb/MMBtu (HHV)
SO_2 Emissions		
Average Uncontrolled SO2 Emission Factor	9.7	lb/MMBtu (HHV)
Average Controlled SO2 Emission Factor	0.1942	lb/MMBtu (HHV)
Maximum Uncontrolled SO2 Emission Factor	11.6	lb/MMBtu (HHV)
Maximum Controlled SO2 Emission Factor	0.2319	lb/MMBtu (HHV)
H_2SO_4 Emissions		
Average H_2SO_4 Emission Factor	0.037	lb/MMBtu (HHV)
Maximum H_2SO_4 Emission Factor	0.044	lb/MMBtu (HHV)
Filterable PM_{10} Emissions		
PM_{10} Emission Rate	0.015	lb/MMBtu (HHV)
Condensible PM_{10} Emissions		
Annual PM_{10} Emission Rate	0.0370	lb/MMBtu (HHV)
Hourly PM_{10} Emission Rate	0.0440	lb/MMBtu (HHV)
Total PM_{10} Emissions		
Annual PM_{10} Emission Rate	0.0520	lb/MMBtu (HHV)
Hourly PM_{10} Emission Rate	0.0590	lb/MMBtu (HHV)
STACK EXHAUST COMPOSISITION		
Argon, Ar	0.44%	vol
Nitrogen, N_2	76.75%	vol
Oxygen O_2	4.07%	vol
Carbon Dioxide, CO_2	13.79%	vol
Water, H_2O	4.95%	vol
Molecular Weight	**29.94**	**lb/lbmol**

Table A-5. CFB Stack Flow Calculations

Las Brisas Energy Center, LLC

Petroleum Coke Composition

Component	Mw	Fuel wt%	Mole Flow Rate (mole/ton)	Fuel mol%
N2	28.013	1.40%	1.0	0.54%
H2	2.016	4.00%	39.7	21.47%
C	12.011	79.40%	132.2	71.53%
S	32.066	6.70%	4.2	2.26%
H2O	18.015	7.00%	7.8	4.20%
			184.8	

Pet Coke Heating Value (HHV)	
13800	BTU/lb

Fuel Input

Fuel Input (MMBTU/hr)	Fuel Flowrate (ton/hr)	Fuel Flowrate (lbmol/hr)
3080.00	111.59	20627.56

Combustion Calculations

Component	Fuel Molar Flowrate (lbmol/hr)	O2 Stoic. Coeff.	Oxygen Requirement (lbmol/hr)	CO2 Stoic. Coeff.	CO2 Production (lbmol/hr)	H2O Stoic. Coeff.	H2O Production (lbmol/hr)
N2	111.5	0	0.0	0	0	0	0.0
H2	4428.3	0.5	2214.2	0	0.0	1	4428.3
C	14754.1	1	14754.1	1	14754.1	0	0.0
S	466.3	1	466.3	0	0.0	0	0.0
H2O	867.2	0	0.0	0	0.0	1	867.2
TOTALS	20627.6		17435		14754		5296

Air Requirements

Based on Maximum Duty
Composition of Air is 21% O2 and 79% N2
Assume 25% Excess Air

O2 Flowrate =	(17,435 lbmol O2/hr)(1 + 0.25)=	21793.27	lbmol/hr
N2 Flowrate =	(21,793 lbmol/hr)(79 lbmol N2/21 lbmol O2)=	81984.21	lbmol/hr
Air Flowrate =	(21,793 lbmol O2/hr)(1 lbmol Air/0.21 lbmol O2)=	103777.49	lbmol/hr
	=	**669,365**	scfm

Stack Flow

Component	Hourly Emission (lb/hr)	Hourly Emission (lbmol/hr)	Wet Conc. (% vol)	Dry Conc. (% vol)
N2	2,299,781	82095.76	76.7%	80.7%
O2	139,477	4358.65	4.1%	4.3%
H2O		5295.57	5.0%	NA
CO2	649,325	14754.11	13.8%	14.5%
S		466.34	0.4%	0.5%
Totals	**3,088,584**	**106,970**		

Stack Parameters (for 2 CFBs with Combined Stack)

Dry Air Flowrate =	203,350	lbmol/hr
Exhaust Gas Temp. =	175	°F
Exhaust Gas Vol. =	1,311,606	scfm
Exhaust Gas Vol. =	1,571,452	acfm
Stack Diameter =	45.0	ft
Exhaust Velocity =	16.5	ft/sec

Table A-6. CFB Emission Calculations (one unit)

Las Brisas Energy Center, LLC

NO_x (hourly)	0.10 lb NO_x / MMBtu	3,080 MMBtu / hr			= 308.0	lb/hr NO_x
NO_x (annual)	0.07 lb NO_x / MMBtu	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb	= 944.3	tpy NO_x
CO (hourly)	0.15 lb CO / MMBtu	3,080 MMBtu / hr			= 462.0	lb/hr CO
CO (annual)	0.15 lb CO / MMBtu	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb	= 2023.6	tpy CO
VOC (hourly)	0.005 lb VOC / MMBtu	3,080 MMBtu / hr			= 15.4	lb/hr VOC
VOC (annual)	0.005 lb VOC / MMBtu	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb	= 67.5	tpy VOC
PM (hourly) **(FRONT HALF)**	0.015 lb / MMBtu	3,080 MMBtu / hr			= 46.2	lb/hr PM **(FRONT HALF)**
PM (annual)	0.015 lb PM / hr	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb	= 202.4	tpy PM
PM (hourly) **(BACK HALF)**	0.044 lb / MMBtu	3,080 MMBtu / hr			= 135.5	lb/hr PM **(BACK HALF)**
PM (annual)	0.037 lb / MMBtu	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb	= 499.1	tpy PM
PM (hourly) **(TOTAL)**	46.2 lb / hr	(front half) + (back half)	135.5 lb / hr		= 181.7	lb/hr PM **(TOTAL)**
PM (annual)	202.4 ton PM / yr	(front half) + (back half)	499.1 ton / yr		= 701.5	tpy PM

Table A-6. CFB Emission Calculations (one unit)

Pollutant	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5		Result	Units
SO_2 (hourly)	0.2319 lb / MMBtu	3,080 MMBtu / hr				=	714.3	lb/hr SO_2
SO_2 (annual)	0.1942 lb / MMBtu	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb		=	2619.8	tpy SO_2
NH_3 (hourly)	9.3 lbmol NH_3 / 1.0E+06 lbmol Flue Gas	101,675 lbmol Flue Gas / hr	17 lb NH_3 / lbmol NH_3			=	16.0	lb/hr NH_3
NH_3 (annual)	4.6 lbmol NH_3 / 1.0E+06 lbmol Flue Gas	101,675 lbmol Flue Gas / hr	17 lb NH_3 / lbmol NH_3	8760 hr / yr	ton / 2000 lb	=	35.132	tpy NH_3
H_2SO_4 (hourly)	0.037 lb / MMBtu	3,080 MMBtu / hr				=	114.0	lb/hr H_2SO_4
H_2SO_4 (annual)	0.037 lb H_2SO_4 / hr	3,080 MMBtu / hr	8760 hr / yr	ton / 2000 lb		=	499.1	tpy H_2SO_4

Table A-7. CFB Trace Compound Data

Las Brisas Energy Center, LLC

Average Concentrations (ppmw)

			From Reliant Energy Limestone Application													
Constituent	Symbol	Average + 25%	Amoco	Citgo/ Lyondell	Conoco	Mobil	Shell	Star	Tex Gulf C.	Utility Fuels	Phillips	Marathon Ashland Refinery Garyville, Louisiana	JEA 80/20 Blend Table 7-4 8/10/04	JEA 80/20 Blend Table 7-4 8/11/04	NISCO	TGS Trace Metals
Aluminum	Al	**57.5**										46				
Arsenic	As	**1.97**	0.6	1		0.1	1	6.3	1.3	2						0.3
Beryllium	Be	**0.51**	0.01	0.36	1	0.01	0.1	0.1	0.23	0.39						1.5
Cadmium	Cd	**0.56**	0.01	0.51	1	0.01	0.23	1.38	0.2	0.59						0.1
Calcium	Ca	**23.75**										19				
Chlorine	Cl	**244.82**		100			190	142	100	539			200	100		
Chromium	Cr	**10.7**	19.8	1.01	2.18	15.6	1.6	1.53	4	30.1	1.25					
Copper	Cu	**4.38**														3.5
Fluorine	F	**22.5**	3.3	10		5.7	23	2	30	43			26	26		11
Iron	Fe	**203.75**										76			250	
Lead	Pb	**2.63**	0.5	1.85	1.1	0.5	1.82	2.47	4.67	3.66			3	3		0.6
Magnesium	Mg	**7.5**										6				
Manganese	Mn	**12**	1.87	1		1.09	46.5	4.14	1	28		0.4				2.4
Mercury	Hg	**0.23**	0.05	0.04		0.05	0.53	0.84	0.04	0.32	0.02	0.001	0.05	0.04		
Nickel	Ni	**383.86**	191	430	245	203	382	113	223	392	400	349			450	
Potassium	K	**35**										28				
Selenium	Se	**0.98**	0.1	0.3		0.1	1	0.93	1.33	0.52						2
Silicon	Si	**65.63**									88	17				
Sodium	Na	**81.25**										65				
Titanium	Ti	**1.25**										1				
Vanadium	V	**1771.94**	963	2340	719	750	1675	502			1692	1317			2800	
Ash		0.48	0.74	0.42	0.23	0.21	0.47	0.28			0.35					

Maximum Concentrations (ppmw)

		Maximum + 50%	Amoco	Citgo/ Lyondell	Conoco	Mobil	Shell	Star	Tex Gulf C.	Utility Fuels	Phillips	Marathon Ashland Refinery Garyville, Louisiana	JEA 80/20 Blend Table 7-4 8/10/04	JEA 80/20 Blend Table 7-4 8/11/04	NISCO	TGS Trace Metals
Aluminum	Al	**69**										46				
Arsenic	As	**14.25**	1.1	1		0.1	1	9.5	2	5.33						0.3
Beryllium	Be	**2.25**	0.01	0.7	1	0.01	0.1	0.1	0.4	0.41						1.5
Cadmium	Cd	**3**	0.01	1	1	0.01	0.3	2	0.3	0.83						0.1
Calcium	Ca	**28.5**										19				
Chlorine	Cl	**1189.5**		100			220	257	100	793			200	100		
Chromium	Cr	**98.13**	19.8	2	2.18	15.6	1.6	2.2	8	65.42	2					
Copper	Cu	**5.25**														3.5
Fluorine	F	**100.5**	4.3	10		5.7	45	5	50	67			26	26		11
Iron	Fe	**375**										76			250	
Lead	Pb	**18**	0.5	2	1.1	0.5	2.2	3.6	12	4.11			3	3		0.6
Magnesium	Mg	**9**										6				
Manganese	Mn	**945**	1.87	1		1.09	80	12	630	78.28		0.4				2.4
Mercury	Hg	**1.5**	0.05	0.06		0.05	1	1	0.05	0.169	0.02	0.001	0.05	0.04		
Nickel	Ni	**880.5**	277	430	245	203	452	171	330	587	412	349			450	
Potassium	K	**42**	0.1	0.3		0.1	1	1	2	0.52		28				
Selenium	Se	**397.5**									265					2
Silicon	Si	**25.5**										17				
Sodium	Na	**97.5**										65				
Titanium	Ti	**1.5**										1				
Vanadium	V	**4200**	1092	2340	719	750	1725	609			1770	1317			2800	
Ash		**1.11**	0.74	0.42	0.23	0.21	0.51	0.36			0.57					

Table A-8. CFB Trace Compound Calculations
Las Brisas Energy Center, LLC

Data:	
Maximum Coke Firing Rate, lb/hr:	223,188.4
Annual Average Coke Firing Rate, lb/hr:	223,188.4
Heat Input - HHV, MMBtu/hr:	3,080.0

Trace Elements	Symbol	Maximum [1] Concentration ppmw	Average [1] Concentration ppmw	Uncontrolled Total lb/hr	Uncontrolled Total tpy	Baghouse Efficiency [2]	Controlled Fly Ash lb/hr	Controlled Fly Ash TPY	HAP?	Total HAP Fly Ash (One Unit) TPY	Total HAP Fly Ash (Four Units) TPY
Aluminum	Al	69.00	57.50	15.40	56.21	99.0%	0.154	0.562	No	--	--
Arsenic	As	14.25	1.97	3.18	1.93	99.0%	0.032	0.019	Yes	0.019	0.077
Beryllium	Be	2.25	0.51	0.50	0.50	99.0%	0.005	0.005	Yes	0.005	0.020
Cadmium	Cd	3.00	0.56	0.67	0.55	99.0%	0.007	0.005	Yes	0.005	0.022
Calcium	Ca	28.50	23.75	6.36	23.22	99.0%	0.064	0.232	No	--	--
Chlorine [3]	Cl	1,189.50	244.82	272.96	239.33	**95.0%**	13.648	11.966	Yes	11.966	47.866
Chromium	Cr	98.13	10.70	21.90	10.46	99.0%	0.219	0.105	Yes	0.105	0.418
Copper	Cu	5.25	4.38	1.17	4.28	99.0%	0.012	0.043	No	--	--
Fluorine [4]	F	100.50	22.50	23.61	22.00	**95.0%**	1.181	1.100	Yes	1.100	4.399
Iron	Fe	375.00	203.75	83.70	199.18	99.0%	0.837	1.992	No	--	--
Lead	Pb	18.00	2.63	4.02	2.57	99.0%	0.040	0.026	No	--	--
Magnesium	Mg	9.00	7.50	2.01	7.33	99.0%	0.020	0.073	No	--	--
Manganese	Mn	945.00	12.00	210.91	11.73	99.0%	2.109	0.117	Yes	0.117	0.469
Mercury [5]	Hg						0.009	0.040	Yes	0.040	0.162
Nickel	Ni	880.50	383.86	196.52	375.25	99.0%	1.965	3.752	Yes	3.752	15.010
Potassium	K	42.00	35.00	9.37	34.21	99.0%	0.094	0.342	No	--	--
Selenium	Se	397.50	0.98	88.72	0.96	99.0%	0.887	0.010	Yes	0.010	0.038
Silicon	Si	25.50	65.63	5.69	64.16	99.0%	0.057	0.642	No	--	--
Sodium	Na	97.50	81.25	21.76	79.43	99.0%	0.218	0.794	No	--	--
Titanium	Ti	1.50	1.25	0.33	1.22	99.0%	0.003	0.012	No	--	--
Vanadium	V	4,200.00	1,771.94	937.39	1,732.19	99.0%	9.374	17.322	No	--	--

	One Unit	Four Units
Individual HAP	**11.97**	**47.87**
Total HAP	**17.12**	**68.48**

NOTES:

Note 1: Values are estimated sources listed below.

Note 2: Baghouse capture 99% except for HCl and HF at 95%.

Note 3: Emitted as HCl; MW Cl = 35.5; MW HCl = 36.5

Note 4: Emitted as HF; MW F = 19; MW HF = 20

Note 5: Controlled emissions based on limit from Part 63, Subpart DDDDD, 3E-06 lb/MMBtu

Table A-9. CFB Cold Start-up Sequence for CFB

Las Brisas Energy Center, LLC

Startup time (hrs)	1	2	3	4	5	6	7	8	9	10	11	12	NOTES
Main steam flow (%MCR)	0%	0%	0%	0%	0%	0%	25%	50%	60%	75%	75%	100%	Ratio calculated based on total heat input.
Petcoke flow (pph)	0	0	0	0	0	0	0	55,797	111,594	133,913	167,391	223,188	Maximum coke firing rate from short-term emission calcs.
Petcoke S content (%)	NA	NA	NA	NA	NA	NA	8%	8%	8%	8%	8%	8%	Petcoke sulfur content (%) from short-term emission calcs.
Petcoke Cl content (%)	NA	NA	NA	NA	NA	NA	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	Cl content from short-term emission calcs.
Petcoke F content (%)	NA	NA	NA	NA	NA	NA	0.0101%	0.0101%	0.0101%	0.0101%	0.0101%	0.01%	F content from short-term emission calcs.
Petcoke fired heat (MMBtu/hr)	0	0	0	0	0	0	0	770	1,540	1,848	2,310	3,080.0	Maximum heat input from short-term emission cals.
Gas heat input (MMBtu/hr)	154	462	770	924	924	924	924	426	0	0	0	0	
Total heat input (MMBtu/hr)	154	462	770	924	924	924	924	1,196	1,540	1,848	2,310	3,080	Calculated as the sum of petcoke and gas MMBtu/hr.
Bed temperature (degrees F)	217	383	533	700	833	1,000	1,167	1,400	1,650	1,650	1,650	1,650.0	
Stack exit flow (scfm)	NA	NA	NA	NA	NA	NA	NA	NA	NA	786,963	983,704	1,311,606	
SO2 Removal Efficiency - (%)	0%	0%	0%	0%	0%	0%	40%	45%	98.0%	98.0%	98.0%	98.0%	
H2SO4 Removal Efficiency (%)	0%	0%	0%	0%	0%	0%	35%	40%	90%	90%	90%	90%	
HCL/HF Removal Efficiency (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	95%	95%	95%	No acid gas scrubbing till hour 10.
NOx Emissions (lb/MMBtu)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.180	0.180	0.1	0.1	0.10	AP-42 Max. of natural gas or propane; max at full load is long-term BACT limit;
SO2 Emissions (lb/MMBtu)	6E-04	6E-04	6E-04	0.0006	0.0006	0.0006	0.0006	4.106	0.232	0.232	0.232	0.232	AP-42 for natural gas; max from short-term spreadsheet
PM/PM10 Emissions (lb/MMBtu)	0.0077	0.0077	0.0077	0.0077	0.0077	0.0077	0.008	0.041	0.059	0.0590	0.0590	0.0590	AP-42 Max. of natural gas or propane; max from short-term spreadsheet
CO Emissions (lb/MMBtu)	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.084	0.180	0.180	0.15	0.15	0.15	AP-42 Max. of natural gas or propane; max from short-term spreadsheet
VOC Emissions (lb/MMBtu)	0.0055	0.0055	0.0055	0.0055	0.0055	0.0055	0.006	0.005	0.005	0.005	0.005	0.005	AP-42 for natural gas; max from short-term spreadsheet
Lead Emissions (lb/MMBtu)	0	0	0	0	0	0	0.00E+00	8.40E-06	1.30E-05	1.30E-05	1.30E-05	1.30E-05	max from trace comp. calcs.
Fluoride Emissions (lb/MMBtu)	0	0	0	0	0	0	0.00E+00	4.94E-03	7.67E-03	3.83E-04	3.83E-04	3.83E-04	max from trace comp. calcs.
H2SO4 Emissions (lb/MMBtu)	0	0	0	0	0	0	0.286	0.264	0.044	0.044	0.044	0.044	max from short-term spreadsheet
HCl Emissions (lb/MMBtu)	0	0	0	0	0	0	0.00E+00	5.71E-02	8.86E-02	4.43E-03	4.43E-03	4.43E-03	max from trace comp. calcs.
Hg Emissions (lb/MMBtu)	0	0	0	0	0	0	0.00E+00	1.93E-06	3.00E-06	3.00E-06	3.00E-06	3.00E-06	max from trace comp. calcs. Calculated based on max lb/hr.
Ammonia (ppm)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	9.3	9.3	max from short-term spreadsheet
NOx Emissions (lb/hr)	15.40	46.20	77.00	92.40	92.40	92.40	92.40	215.28	277.20	184.80	231.00	308.00	**TABLE 1(A) = 308.00**
SO2 Emissions (lb/hr)	0.09	0.28	0.46	0.55	0.55	0.55	0.55	4,910.48	357.13	428.55	535.69	714.25	**TABLE 1(A) = 4,910.48**
PM/PM10 Emissions (lb/hr)	1.18	3.54	5.90	7.08	7.08	7.08	7.08	48.69	90.86	109.03	136.29	181.72	**TABLE 1(A) = 181.72**
CO Emissions (lb/hr)	12.86	38.59	64.31	77.18	77.18	77.18	77.18	215.28	277.20	277.20	346.50	462.00	**TABLE 1(A) = 462.00**
VOC Emissions (lb/hr)	0.85	2.56	4.27	5.12	5.12	5.12	5.12	6.21	7.70	9.24	11.55	15.40	**TABLE 1(A) = 15.40**
Lead Emissions (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.04	**TABLE 1(A) = 0.04**
Fluoride Emissions (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90	11.81	0.71	0.89	1.18	**TABLE 1(A) = 11.81**
H2SO4 Emissions (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	264.26	315.74	67.76	81.31	101.64	135.52	**TABLE 1(A) = 315.74**
HCl Emissions (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.24	136.48	8.19	10.24	13.65	**TABLE 1(A) = 136.48**
Hg Emissions (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	**TABLE 1(A) = 0.01**
Ammonia Emissions (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.25	24.06	32.08	**TABLE 1(A) = 32.08**

Natural gas emission factors from AP-42 Table 1.4-1 for Large Wall-Fired Boilers Controlled Low Nox Burners and Table 1.4-2.
Shaded cells represent the maximum short-term emissions for that contaminant.

Table A-10. Piping Equipment Fugitive Emission Calculations

Las Brisas Energy Center, LLC

EPN	FIN	Source Type	Stream State	Component Count	SOCMI w/o C2 (lb/hr/comp.)	Control Efficiency (%)	% Ammonia	NH_3 Emission Rates	
								Hourly (lb/hr)	Annual (tpy)
FUG-NH3A	FUG-NH3A	Valves	Gas/Vapor	200	0.0089	97%	100%	0.053	0.234
		Relief Valves	Gas/Vapor	1	0.2293	97%	100%	0.007	0.030
		Flanges	Gas/Vapor	500	0.0029	97%	100%	0.044	0.191
						Total:		**0.10**	**0.45**

EPN	FIN	Source Type	Stream State	Component Count	SOCMI w/o C2 (lb/hr/comp.)	Control Efficiency (%)	% Ammonia	NH_3 Emission Rates	
								Hourly (lb/hr)	Annual (tpy)
FUG-NH3B	FUG-NH3B	Valves	Gas/Vapor	200	0.0089	97%	100%	0.053	0.234
		Relief Valves	Gas/Vapor	1	0.2293	97%	100%	0.007	0.030
		Flanges	Gas/Vapor	500	0.0029	97%	100%	0.044	0.191
						Total:		**0.10**	**0.45**

EPN	FIN	Source Type	Stream State	Component Count	SOCMI w/o C2 (lb/hr/comp.)	Control Efficiency (%)	% VOC	VOC Emission Rates	
								Hourly (lb/hr)	Annual (tpy)
FUG-NG	FUG-NG	Valves	Gas/Vapor	100	0.0089	0%	11%	0.102	0.445
		Relief Valves	Gas/Vapor	1	0.2293	97%	100%	0.007	0.030
		Flanges	Gas/Vapor	250	0.0029	0%	11%	0.083	0.363
						Total:		**0.19**	**0.84**

EPN	FIN	Source Type	Stream State	Component Count	SOCMI w/o C2 (lb/hr/comp.)	Control Efficiency (%)	% VOC	VOC Emission Rates	
								Hourly (lb/hr)	Annual (tpy)
FUG-PROP1	FUG-PROP1	Valves	Gas/Vapor	25	0.0089	0%	100%	0.223	0.975
		Relief Valves	Gas/Vapor	1	0.2293	97%	100%	0.007	0.030
		Flanges	Gas/Vapor	63	0.0029	0%	100%	0.183	0.800
						Total:		**0.41**	**1.80**

EPN	FIN	Source Type	Stream State	Component Count	SOCMI w/o C2 (lb/hr/comp.)	Control Efficiency (%)	% VOC	VOC Emission Rates	
								Hourly (lb/hr)	Annual (tpy)
FUG-PROP2	FUG-PROP2	Valves	Gas/Vapor	25	0.0089	0%	100%	0.222	0.974
		Relief Valves	Gas/Vapor	1	0.2293	97%	100%	0.007	0.030
		Flanges	Gas/Vapor	63	0.0029	0%	100%	0.183	0.800
						Total:		**0.41**	**1.80**

Notes:
[1] Emission factors were taken from TCEQ's Guidance Documents for "Equipment Leak Fugitives".
[2] Control efficiency claimed for weekly Audio Visual Olfactory (AVO) program.

Sample Calculations:

Hourly Emissions for Valves = 200 x 0.0089 x 3.00 % 100.00 % = 0.053 lb/hr

Annual Emissions for Valves = 0.053 lb | 8760 hr / yr | 1 ton / 2000 lb = 0.234 tpy

Table A-11. Fabric Filter Emission Calculations

Las Brisas Energy Center, LLC

EPN	FIN	Source	Est. Baghouse Flowrate SCFM	Hours of Annual Operation	Exhaust Conc. Grains/dscf	Particulate Emissions (PM_{10})	
SILO-FA1	SILO-FA1	Fly Ash Silo No. 1	7,300	8,760	0.01	0.626	2.741
SILO-FA2	SILO-FA2	Fly Ash Silo No. 2	7,300	8,760	0.01	0.626	2.741
SILO-FA3	SILO-FA3	Fly Ash Silo No. 3	7,300	8,760	0.01	0.626	2.741
SILO-FA4	SILO-FA4	Fly Ash Silo No. 4	7,300	8,760	0.01	0.626	2.741
SILO-BA1	SILO-BA1	Bottom Ash Silo No. 1	5,520	8,760	0.01	0.473	2.072
SILO-BA2	SILO-BA2	Bottom Ash Silo No. 2	5,520	8,760	0.01	0.473	2.072
SILO-BA3	SILO-BA3	Bottom Ash Silo No. 3	5,520	8,760	0.01	0.473	2.072
SILO-BA4	SILO-BA4	Bottom Ash Silo No. 4	5,520	8,760	0.01	0.473	2.072
SILO-COKE1	SILO-COKE1	Coke Silo No.1	33,000	5,782	0.01	2.829	8.177
SILO-COKE2	SILO-COKE2	Coke Silo No.2	33,000	5,782	0.01	2.829	8.177
SILO-COKE3	SILO-COKE3	Coke Silo No.3	33,000	5,782	0.01	2.829	8.177
SILO-COKE4	SILO-COKE4	Coke Silo No.4	33,000	5,782	0.01	2.829	8.177
SILO-COKE5	SILO-COKE5	Coke Silo No.5	33,000	5,782	0.01	2.829	8.177
SILO-COKE6	SILO-COKE6	Coke Silo No.6	33,000	5,782	0.01	2.829	8.177
SILO-COKE7	SILO-COKE7	Coke Silo No.7	33,000	5,782	0.01	2.829	8.177
SILO-COKE8	SILO-COKE8	Coke Silo No.8	33,000	5,782	0.01	2.829	8.177
SILO-LMST1	SILO-LMST1	Limestone Bunker No. 1	800	3,000	0.01	0.069	0.103
SILO-LMST2	SILO-LMST2	Limestone Bunker No. 2	800	3,000	0.01	0.069	0.103
SILO-LMST3	SILO-LMST3	Limestone Bunker No. 3	800	3,000	0.01	0.069	0.103
SILO-LMST4	SILO-LMST4	Limestone Bunker No. 4	800	3,000	0.01	0.069	0.103
SILO-ACI1	SILO-ACI1	Carbon for ACI Silo No. 1	1600	3,000	0.01	0.137	0.206
SILO-ACI2	SILO-ACI2	Carbon for ACI Silo No. 2	1600	3,000	0.01	0.137	0.206
SILO-ACI3	SILO-ACI3	Carbon for ACI Silo No. 3	1600	3,000	0.01	0.137	0.206
SILO-ACI4	SILO-ACI4	Carbon for ACI Silo No. 4	1600	3,000	0.01	0.137	0.206
SILO-LIME1	SILO-LIME1	Lime Silo No. 1	1600	3,000	0.01	0.137	0.206
SILO-LIME2	SILO-LIME2	Lime Silo No. 2	1600	3,000	0.01	0.137	0.206
SILO-LIME3	SILO-LIME3	Lime Silo No. 3	1600	3,000	0.01	0.137	0.206
SILO-LIME4	SILO-LIME4	Lime Silo No. 4	1600	3,000	0.01	0.137	0.206
SILO-LIME5	SILO-LIME5	Lime Silo No. 5	1600	3,000	0.01	0.137	0.206
SILO-LIME6	SILO-LIME6	Lime Silo No. 6	1600	3,000	0.01	0.137	0.206
SILO-LIME7	SILO-LIME7	Lime Silo No. 7	1600	3,000	0.01	0.137	0.206
SILO-LIME8	SILO-LIME8	Lime Silo No. 8	1600	3,000	0.01	0.137	0.206
BIN-SAND1	BIN-SAND1	Unit 1 Sand Day Bin	500	3,000	0.01	0.043	0.064
BIN-SAND2	BIN-SAND2	Unit 2 Sand Day Bin	500	3,000	0.01	0.043	0.064
BIN-SAND3	BIN-SAND3	Unit 3 Sand Day Bin	500	3,000	0.01	0.043	0.064
BIN-SAND4	BIN-SAND4	Unit 4 Sand Day Bin	500	3,000	0.01	0.043	0.064
WT-LIME	WT-LIME	Water Treatment Lime Silo	1,000	3,000	0.01	0.086	0.129
WT-SODA	WT-SODA	Water Treatment Soda Ash Silo	1,000	3,000	0.01	0.086	0.129
					Total:	**29.29**	**88.06**

Assumptions: All PM from baghouses = PM10

Notes:
[1] Guranteed Emission Rate, Fan Capacity and Annual Operation are based on preliminary design.

Sample Calculations:

$$\text{Maximum Hourly for SILO-FA1} = \frac{0.01\ \text{gr}}{\text{dscf}} \times \frac{7300\ \text{scf}}{} \times \frac{60\ \text{min}}{\text{hr}} \times \frac{1\ \text{lb}}{7000\ \text{gr}} = 0.63\ \text{lb/hr}$$

$$\text{Annual for SILO-FA1} = \frac{0.626\ \text{lb}}{\text{hr}} \times \frac{8760\ \text{hr}}{\text{yr}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} = 2.74\ \text{tpy}$$

NOTES:
1. The limestone bunkers will be have either one fabric filter at 800 cfm or two fabric filters at 400 cfm each.

Table A-12. Cooling Tower Emission Calculations

Las Brisas Energy Center, LLC

Cooling Tower Data		
Annual Operating Hours	8760	
Drift %	0.0005%	
TDS in Circulating Water (ppm)	16000	
% Mass of drift with PM10	2.44%	Note: Interpolated from Table Below

				PM/PM10		PM10	
EPN	FIN	Name	Cooling Water Rate (gpm)	Emissions Rate lb/hr	Emissions Rate ton/yr	Emissions Rate lb/hr	Emissions Rate ton/yr
CTWR1	CTWR1	Cooling Tower #1	300,000	12.01	52.60	0.29	1.29
CTWR2	CTWR2	Cooling Tower #2	300,000	12.01	52.60	0.29	1.29

PM = Recirc. Rate,gpm * Drift% * 8.34 lb/gal * 60 min/hr * TDS ppm/1000000

PM10 Particle Size Calculation

Typical Cooling Tower Droplet Size Mean (Dd, microns)	Distribution (% Mass Smaller Than)	Particle Size (Dp, microns)
10	0.000	1.937
20	0.196	3.875
30	0.226	5.812
40	0.514	7.750
50	1.816	9.687
60	5.702	11.625
70	21.348	13.562
90	49.812	17.437
110	70.509	21.312
130	82.023	25.187
150	88.000	29.062
180	12.000	34.874
210	91.032	40.687
240	92.469	46.499
270	94.091	52.311
300	94.689	58.124
350	96.288	67.811
400	97.011	77.498
450	98.340	87.186
500	99.071	96.873
600	100.000	116.248

Dp = Dd * [(pd/pp) * (TDS) / 1,000,000)] ^ 1/3

where: Density of Water (pd)= 1

Denisty of TDS (pp) = 2.2

Table A-13. Emergency Diesel Generator (EDG) Emissions

Las Brisas Energy Center, LLC

Description: **Two 1,600 kW diesel-fired emergency generators**

Operating Parameters for Each Generator

Parameter	Value	Units
Diesel Generator Input:	1,722	kW
Diesel Generator Output:	1600	kW
Assumed Generator Efficiency [1]:	92.9%	
Diesel Engine Input:	6,997	hp
Diesel Engine Input:	17.80	MMBtu/hr
Diesel Engine Output:	2,309	hp
Diesel Engine Output:	5.87	MMBtu/hr
Assumed Diesel Engine Efficiency [1]:	33%	
Engine Fuel Consumption:	7,709	Btu/hp-hr
Exhaust Gas Temperature:	855	°F
Heating Value for No. 2 Fuel Oil:	141,000	Btu/gal
Maximum Fuel Firing Rate for the Diesel Generator:	126.2	gal/hr
Maximum Fuel Firing Rate for the Diesel Generator:	925.0	lb/hr
Maximum Annual Hours of Operation [2]:	500	hour/year

Emission Factors [3]

SO_2	NO_x	PM-10	CO	VOC	H_2SO_4
lb/MMBtu Heat Input	(g/hp-hr) output	(g/hp-hr) output	(g/hp-hr) output	lb/MMBtu Heat Input	lb/MMBtu Heat Input
0.026	4.77	0.12	2.61	0.0819	0.002

EPN	FIN	Description	Hourly Emissions (lb/hr)					
			CO	NO_x	PM-10	VOC	SO_2	H_2SO_4
ENG-EG1	ENG-EG1	Diesel-Fired Emergency Generator 1	13.30	24.30	0.61	1.46	0.46	0.04
ENG-EG2	ENG-EG2	Diesel-Fired Emergency Generator 2	13.30	24.30	0.61	1.46	0.46	0.04
			Annual Emissions (tpy)					
ENG-EG1	ENG-EG1	Diesel-Fired Emergency Generator 1	3.30	6.10	0.15	0.37	0.12	0.009
ENG-EG2	ENG-EG2	Diesel-Fired Emergency Generator 2	3.30	6.10	0.15	0.37	0.12	0.009

SO_2 Emission Factor Calculation

Parameter	Value	Unit
Sulfur Content of Fuel	0.05%	% (max)
Fuel Oil Heating Value	141,000	Btu/gal
Fuel Oil Density	7.33	lb/gal
Fuel Oil Heating Value	19,236	Btu/lb
Fuel Oil Firing Rate	925	lb oil/hr
Sulfur into Engine	0.46	lb S/hr
SO_2 Emission Factor	0.026	lb SO2/MMBtu
SO_2 Emission Factor	3.67	lb SO_2/1,000 gal

Stack Data

Parameter	Value	Unit
Height	20	ft. above-ground level (estimate)
Diameter	20	inches
Exhaust Temperature	855	°F
Exhaust Velocity	92.0	ft/sec

Notes:

1] Efficiencies for the engine are estimated from typical vendor data.

2] Annual emissions were calculated based on a maximum firing rate of 500 hours per year.

3] Emission factors for NOx, CO, and PM10 were based on the compression ignition internal combustion engine (CI ICE) NSPS (71 FR 39152, July 11, 2006).
The NOx emission rate was based on the NSPS standard for NOx+NMHC.
The VOC emission factor was taken from AP-42 Table 3.4-1, Gaseous Emission Factors for Large Stationary Diesel Engines.
The SO2 emission factor was calculated based on a maximum fuel sulfur content of 0.05%.
The H2SO4 emission factor was calculated assuming 5% SO2 to SO3 conversion during combustion.

Sample Calculations:

CO Hourly Emissions for EP-ENG-EG1 = $\frac{2.61\ g}{hp\text{-}hr} \times \frac{2309\ hp}{} \times \frac{lb}{453.6\ g}$ = 13.30 lb/hr

CO Annual Emissions for EP-ENG-EG1 = $\frac{13.3\ lb}{hr} \times \frac{500\ hr}{yr} \times \frac{1\ ton}{2000\ lb}$ = 3.30 tpy

Table A-14. Diesel-Fired Fire Water Pump Emissions

Las Brisas Energy Center, LLC

Operating Parameters for Each Generator		
Parameter	**Value**	**Units**
Diesel Engine Output:	360	hp
Diesel Engine Output:	0.92	MMBtu/hr
Assumed Diesel engine efficiency [1]:	33%	
Diesel Engine Input:	1,090.9	hp
Diesel Engine Input:	2.78	MMBtu/hr
Engine Fuel Consumption:	7,709	Btu/hp-hr
Exhaust Gas Temperature:	845	°F
Heating Value for No. 2 Fuel Oil:	141,000	Btu/gal
Maximum Fuel Firing Rate for the Engine:	19.7	gal/hr
Maximum Fuel Firing Rate for the Engine:	144	lb/hr
Maximum Annual Hours of Operation [2]:	500	hours/year

Emission Factors [3]					
SO_2	**NO_x**	**CO**	**PM-10**	**VOC**	**H_2SO_4**
lb/MMBtu Heat Input	**g/hp-hr (output)**	**g/hp-hr (output)**	**g/hp-hr (output)**	**lb/MMBtu Heat Input**	**lb/MMBtu Heat Input**
0.026	3	2.60	0.15	0.00247	0.002

EPN	FIN	Description	Hourly Emissions (lb/hr)					
			CO	NO_x	PM-10	VOC	SO_2	H_2SO_4
ENG-FWMAIN	ENG-FWMAIN	Main Diesel-Fired Fire Water Pump	2.06	2.38	0.12	0.89	0.07	0.01
			Annual Emissions (tpy)					
ENG-FWMAIN	ENG-FWMAIN	Main Diesel-Fired Fire Water Pump	0.52	0.60	0.03	0.22	0.02	0.002

SO_2 Emission Factor		
Parameter	**Value**	**Unit**
Sulfur Content of Fuel	0.05%	% (max)
Fuel Oil Heating Value	141,000	Btu/gal
Fuel Oil Density	7.33	lb/gal
Fuel Oil Heating Value	19,236	Btu/lb
Fuel Oil Firing Rate	144	lb oil / hr
Sulfur into Engine	0.07	lb S / hr
SO_2 Emission Factor	0.026	lb SO2/MMBtu
SO_2 Emission Factor	3.67	lb SO2/1,000 gal

Stack Data (Preliminary)

Parameter	Value	Unit
Height	12	ft. above-ground level (approx.)
Diameter	3	inches
Exhaust Temperature	845	°F (data sheet for recently purchased FWP)
Exhaust Velocity	135.0	ft/sec. (data sheet for recently purchased FWP)

Notes:

1] Engine efficiencies were estimated from typical vendor data.

2] Annual emissions were calculated based on a maximum firing rate of 500 hours per year.

3] Emission factors for NOx, CO, and PM10 were based on the compression ignition internal combustion engine (CI ICE) NSPS (71 FR 39152, July 11, 2006).
The NOx emission rate was based on the NSPS standard for NOx+NMHC.
The VOC emission factor was taken from AP-42 Table 3.3-1, Emission Factors for Gasoline and Diesel Industrial Engines.
The SO_2 emission factor was calculated based on a maximum fuel sulfur content of 0.05%.
The H_2SO_4 emission factor was calculated assuming 5% SO_2 to SO_3 conversion during combustion.

Sample Calculations:

CO Hourly Emissions for EP-ENG-FWMAIN = $\frac{2.6\ g}{hp\text{-}hr} \left| \frac{360\ hp}{} \right| \frac{lb}{453.6\ g}$ = 2.06 lb/hr

CO Annual Emissions for EP-ENG-FWMAIN = $\frac{2.06\ lb}{hr} \left| \frac{500\ hr}{yr} \right| \frac{1\ ton}{2000\ lb}$ = 0.52 tpy

Table A-15. Diesel-Fired Fire Water Booster Pump Emissions

Las Brisas Energy Center, LLC

Operating Parameters for Each Generator		
Parameter	**Value**	**Units**
Diesel Engine Output:	100	hp
Diesel Engine Output:	0.25	MMBtu/hr
Assumed Diesel engine efficiency [1]:	33%	
Diesel Engine Input:	303.0	hp
Diesel Engine Input:	0.77	MMBtu/hr
Engine Fuel Consumption:	7,709	Btu/hp-hr
Exhaust Gas Temperature:	845	°F
Heating Value for No. 2 Fuel Oil:	141,000	Btu/gal
Maximum Fuel Firing Rate for the Engine:	5.5	gal/hr
Maximum Fuel Firing Rate for the Engine:	40	lb/hr
Maximum Annual Hours of Operation [2]:	500	hours/year

Emission Factors [3]					
SO_2	**NO_x**	**CO**	**PM-10**	**VOC**	**H_2SO_4**
lb/MMBtu Heat Input	**g/hp-hr (output)**	**g/hp-hr (output)**	**g/hp-hr (output)**	**lb/MMBtu Heat Input**	**lb/MMBtu Heat Input**
0.026	3	2.60	0.15	0.00247	0.002

EPN	**FIN**	**Description**	**Hourly Emissions (lb/hr)**					
			CO	**NO_x**	**PM-10**	**VOC**	**SO_2**	**H_2SO_4**
ENG-FWB1	ENG-FWB1	Diesel-Fired Fire Water Booster Pump 1	0.57	0.66	0.03	0.25	0.02	0.002
ENG-FWB2	ENG-FWB2	Diesel-Fired Fire Water Booster Pump 2	0.57	0.66	0.03	0.25	0.02	0.002
ENG-FWB3	ENG-FWB3	Diesel-Fired Fire Water Booster Pump 3	0.57	0.66	0.03	0.25	0.02	0.002
ENG-FWB4	ENG-FWB4	Diesel-Fired Fire Water Booster Pump 4	0.57	0.66	0.03	0.25	0.02	0.002
			Annual Emissions (tpy)					
ENG-FWB1	ENG-FWB1	Diesel-Fired Fire Water Booster Pump 1	0.14	0.17	0.01	0.06	0.01	0.001
ENG-FWB2	ENG-FWB2	Diesel-Fired Fire Water Booster Pump 2	0.14	0.17	0.01	0.06	0.01	0.001
ENG-FWB3	ENG-FWB3	Diesel-Fired Fire Water Booster Pump 3	0.14	0.17	0.01	0.06	0.01	0.001
ENG-FWB4	ENG-FWB4	Diesel-Fired Fire Water Booster Pump 4	0.14	0.17	0.01	0.06	0.01	0.001

SO_2 Emission Factor		
Parameter	**Value**	**Unit**
Sulfur Content of Fuel	0.05%	% (max)
Fuel Oil Heating Value	141,000	Btu/gal
Fuel Oil Density	7.33	lb/gal
Fuel Oil Heating Value	19,236	Btu/lb
Fuel Oil Firing Rate	40	lb oil / hr
Sulfur into Engine	0.02	lb S / hr
SO_2 Emission Factor	0.026	lb SO2/MMBtu
SO_2 Emission Factor	3.67	lb SO2/1,000 gal

Stack Data (Preliminary)

Parameter	**Value**	**Unit**
Height	12	ft. above-ground level (approx.)
Diameter	3.3	inches
Exhaust Temperature	845	°F
Exhaust Velocity	90.0	ft/sec.

Notes:

1] Engine efficiencies were estimated from typical vendor data.

2] Annual emissions were calculated based on a maximum firing rate of 500 hours per year.

3] Emission factors for NOx, CO, and PM10 were based on the compression ignition internal combustion engine (CI ICE) NSPS (71 FR 39152, July 11, 2006).
The NOx emission rate was based on the NSPS standard for NOx+NMHC.
The VOC emission factor was taken from AP-42 Table 3.3-1, Emission Factors for Gasoline and Diesel Industrial Engines.
The SO_2 emission factor was calculated based on a maximum fuel sulfur content of 0.05%.
The H_2SO_4 emission factor was calculated assuming 5% SO_2 to SO_3 conversion during combustion.

Sample Calculations:

CO Hourly Emissions for EP-ENG-FWB1 = $\frac{2.6\text{ g}}{\text{hp-hr}} \times \frac{100\text{ hp}}{} \times \frac{\text{lb}}{453.6\text{ g}}$ = 0.57 lb/hr

CO Annual Emissions for EP-ENG-FWB1 = $\frac{0.57\text{ lb}}{\text{hr}} \times \frac{500\text{ hr}}{\text{yr}} \times \frac{1\text{ ton}}{2000\text{ lb}}$ = 0.14 tpy

Table A-16. Diesel-Fired Emergency Boiler Feed Water Pump Emissions

Las Brisas Energy Center, LLC

Operating Parameters for Each Generator		
Parameter	**Value**	**Units**
Diesel Engine Output:	2000	hp
Diesel Engine Output:	5.09	MMBtu/hr
Assumed Diesel engine efficiency [1]:	33%	
Diesel Engine Input:	6,060.6	hp
Diesel Engine Input:	15.42	MMBtu/hr
Engine Fuel Consumption:	7,709	Btu/hp-hr
Exhaust Gas Temperature:	845	°F
Heating Value for No. 2 Fuel Oil:	141,000	Btu/gal
Maximum Fuel Firing Rate for the Engine:	109.3	gal/hr
Maximum Fuel Firing Rate for the Engine:	802	lb/hr
Maximum Annual Hours of Operation [2]:	500	hours/year

Emission Factors [3]					
SO_2	NO_x	CO	PM-10	VOC	H_2SO_4
lb/MMBtu Heat Input	g/hp-hr (output)	g/hp-hr (output)	g/hp-hr (output)	lb/MMBtu Heat Input	lb/MMBtu Heat Input
0.026	3	2.60	0.15	0.00247	0.002

EPN	FIN	Description	Hourly Emissions (lb/hr)					
			CO	NO_x	PM-10	VOC	SO_2	H_2SO_4
ENG-BFWP1	ENG-BFWP1	Diesel-Fired Boiler Feed Water Pump 1	11.46	13.23	0.66	4.94	0.40	0.03
ENG-BFWP2	ENG-BFWP2	Diesel-Fired Boiler Feed Water Pump 2	11.46	13.23	0.66	4.94	0.40	0.03
ENG-BFWP3	ENG-BFWP3	Diesel-Fired Boiler Feed Water Pump 3	11.46	13.23	0.66	4.94	0.40	0.03
ENG-BFWP4	ENG-BFWP4	Diesel-Fired Boiler Feed Water Pump 4	11.46	13.23	0.66	4.94	0.40	0.03
			Annual Emissions (tpy)					
ENG-BFWP1	ENG-BFWP1	Diesel-Fired Boiler Feed Water Pump 1	2.87	3.31	0.17	1.24	0.10	0.008
ENG-BFWP2	ENG-BFWP2	Diesel-Fired Boiler Feed Water Pump 2	2.87	3.31	0.17	1.24	0.10	0.008
ENG-BFWP3	ENG-BFWP3	Diesel-Fired Boiler Feed Water Pump 3	2.87	3.31	0.17	1.24	0.10	0.008
ENG-BFWP4	ENG-BFWP4	Diesel-Fired Boiler Feed Water Pump 4	2.87	3.31	0.17	1.24	0.10	0.008

SO_2 Emission Factor		
Parameter	**Value**	**Unit**
Sulfur Content of Fuel	0.05%	% (max)
Fuel Oil Heating Value	141,000	Btu/gal
Fuel Oil Density	7.33	lb/gal
Fuel Oil Heating Value	19,236	Btu/lb
Fuel Oil Firing Rate	802	lb oil / hr
Sulfur into Engine	0.40	lb S / hr
SO_2 Emission Factor	0.026	lb SO2/MMBtu
SO_2 Emission Factor	3.67	lb SO2/1,000 gal

Stack Data (Preliminary)

Parameter	Value	Unit
Height	30	ft. above-ground level (approx.)
Diameter	20.0	inches
Exhaust Temperature	845	°F
Exhaust Velocity	90.0	ft/sec.

Notes:

1] Engine efficiencies were estimated from typical vendor data.

2] Annual emissions were calculated based on a maximum firing rate of 500 hours per year.

3] Emission factors for NOx, CO, and PM10 were based on the compression ignition internal combustion engine (CI ICE) NSPS (71 FR 39152, July 11, 2006).
The NOx emission rate was based on the NSPS standard for NOx+NMHC.
The VOC emission factor was taken from AP-42 Table 3.3-1, Emission Factors for Gasoline and Diesel Industrial Engines.
The SO_2 emission factor was calculated based on a maximum fuel sulfur content of 0.05%.
The H_2SO_4 emission factor was calculated assuming 5% SO_2 to SO_3 conversion during combustion.

Sample Calculations:

CO Hourly Emissions for EP-ENG-BFWP1 = $\frac{2.6\ g}{hp\text{-}hr} \times 2000\ hp \times \frac{lb}{453.6\ g}$ = 11.46 lb/hr

CO Annual Emissions for EP-ENG-BFWP1 = $\frac{11.46\ lb}{hr} \times \frac{500\ hr}{yr} \times \frac{1\ ton}{2000\ lb}$ = 2.87 tpy

Table A-17. Storage Tank Emission Calculations

Las Brisas Energy Center, LLC

Tank Service	EPN	FIN	Tank Name	Pollutant	Emission Rate	
					lb/hr	tpy
Main Diesel-Fired Fire Water Pump	TNK-FWMAIN	TNK-FWMAIN	Diesel Tank for Main Diesel-Fired Fire Water Pump	VOC	0.010	0.0002
Diesel-Fired Emergency Generator 1	TNK-EG1	TNK-EG1	Diesel Tank for Emergency Generator 1	VOC	0.010	0.0001
Diesel-Fired Emergency Generator 2	TNK-EG2	TNK-EG2	Diesel Tank for Emergency Generator 2	VOC	0.010	0.0001
Diesel-Fired Fire Water Booster Pump 1	TNK-FWB1	TNK-FWB1	Diesel Tank for Fire Water Booster Pump 1	VOC	0.010	0.0003
Diesel-Fired Fire Water Booster Pump 2	TNK-FWB2	TNK-FWB2	Diesel Tank for Fire Water Booster Pump 2	VOC	0.010	0.0003
Diesel-Fired Fire Water Booster Pump 3	TNK-FWB3	TNK-FWB3	Diesel Tank for Fire Water Booster Pump 3	VOC	0.010	0.0003
Diesel-Fired Fire Water Booster Pump 4	TNK-FWB4	TNK-FWB4	Diesel Tank for Fire Water Booster Pump 4	VOC	0.010	0.0003
Diesel-Fired Boiler Feed Water Pump 1	TNK-BFWP1	TNK-BFWP1	Diesel Tank for Boiler Feed Water Pump 1	VOC	0.010	0.0004
Diesel-Fired Boiler Feed Water Pump 2	TNK-BFWP2	TNK-BFWP2	Diesel Tank for Boiler Feed Water Pump 2	VOC	0.010	0.0004
Diesel-Fired Boiler Feed Water Pump 3	TNK-BFWP3	TNK-BFWP3	Diesel Tank for Boiler Feed Water Pump 3	VOC	0.010	0.0004
Diesel-Fired Boiler Feed Water Pump 4	TNK-BFWP4	TNK-BFWP4	Diesel Tank for Boiler Feed Water Pump 4	VOC	0.010	0.0004
				Total:	**0.115**	**0.0032**
Acid Storage Tank	TNK-ACID	TNK-ACID	Acid Storage Tank	H_2SO_4	0.162	0.003
Base Storage Tank	TNK-BASE	TNK-BASE	Base Storage Tank	NaOH	0.069	0.001

Parameter Name & Variable		Units	Value						Notes
Tank Name			**Diesel Storage Tank for Main Fire Water Pump**	**Diesel Storage Tanks for Emergency Generators**	**Diesel Storage Tanks for Booster Pumps**	**Diesel Storage Tank for Emergency Boiler Feed Water Pumps**	**Acid Storage Tank**	**Base Storage Tank**	
Material			Diesel	Diesel	Diesel	Diesel	Sulfuric Acid	Sodium Hydroxide	
Type			Horizontal	Horizontal	Horizontal	Horizontal	Vertical	Vertical	
Throughput	Q	gal/yr	9,841	2,734	54,674	63,100	300,000	300,000	
Tank Height/Length	H_S	ft	4.6	4.6	4.6	4.6	16.0	16.0	
Average Liquid Height	H_L	ft	2.3	2.3	2.3	2.3	8	8	H_S / 2
Diameter	D	ft	3	3	3	3	8	8	
Effective Diameter	De	ft	4.19	4.19	4.19	4.19	12.77	12.77	
Tank Liquid Volume	V_{LX}	ft3	33	33	33	33	804	804	(D/2)^2 * pi * H_S
Tank Liquid Volume	T_{CG}	gal	243	243	243	243	6,016	6,016	VLX * 7.481
Turnovers	N		40.46	11.24	224.78	259.42	49.87	49.87	5.614*Q / V_{LX}
Maximum Fill Rate	FRm	gal/hr	243	243	243	243	6,016	6,016	
Roof Slope	S_R	ft/ft	0	0	0	0	0	0	
Tank Color/Shade			Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	
Paint Solar Absorptance	α	-	0.39	0.39	0.39	0.39	0.39	0.39	
Daily Total Solar Insolation Factor	I	$Btu/ft^2 \cdot d$	1448.00	1448.00	1448.00	1448.00	1448.00	1448.00	
Daily Maximum Ambient Temperature	T_{AX}	ºF	81.0	81.0	81.0	81.0	81.0	81.0	
Daily Minimum Ambient Temperature	T_{AN}	ºF	62.0	62.0	62.0	62.0	62.0	62.0	
Daily Ambient Temp. Change	DT_A	ºR	19.000	19.000	19.000	19.000	19.000	19.000	T_{AX} - T_{AN}
Daily Avg. Ambient Temperature	T_{AA}	ºR	531.170	531.170	531.170	531.170	531.170	531.170	((T_{AX}+459.67)+(T_{AN}+459.67))/2
Liquid Bulk Temperature	T_b	ºR	532.510	532.510	532.510	532.510	532.510	532.510	T_{AA} + 6α -1
Daily Avg. Liquid Surface Temp.	T_{LA}	ºR	536.382	536.382	536.382	536.382	536.382	536.382	0.44T_{AA}+0.56T_{Tb}+0.0079(α*I)
Daily Max. Avg. Liq. Surf. Temp.	$\mathbf{T_{LX}}$	ºR	543.755	543.755	543.755	543.755	543.755	543.755	T_{LA}+0.25*DT_V
Daily Min. Avg. Liq. Surf. Temp.	T_{LN}	ºR	529.009	529.009	529.009	529.009	529.009	529.009	T_{LA}-0.25*DT_V
Daily Vapor Temperature Range	DT_V	ºR	29.492	29.492	29.492	29.492	29.492	29.492	0.72*DT_A+0.028*α*I
Liquid Molecular Wt.	M_L	lb/lb-mole	188	188	188	188	94	40	
Vapor Molecular Wt.	M_V	lb/lb-mole	130	130	130	130	94	40	
Reid Vapor Pressure	RVP	psi							
Slope	SI	°F/vol %							
C-C Vapor Pressure Equation Constant A	A	dimensionless	12.101	12.101	12.101	12.101			
C-C Vapor Pressure Equation Constant B	B	ºR	8907.0	8907.0	8907.0	8907.0			
True Vapor Pressure @ T_{LA}	P_{VA}	psia @ $\mathbf{T_{LA}}$	0.011	0.011	0.011	0.011	0.010	0.010	
True Vapor Pressure @ T_{LX}	P_{VX}	psia @ $\mathbf{T_{LX}}$	0.014	0.014	0.014	0.014	0.012	0.012	
True Vapor Pressure @ T_{LN}	P_{VN}	psia @ $\mathbf{T_{LN}}$	0.009	0.009	0.009	0.009	0.008	0.008	
Vapor Pressure Function	P*	dimensionless	0.00038	0.00038	0.00038	0.00038	0.00034	0.00034	P_{VA}/P_A/(1+(1-(P_{VA}/P_A))^0.5)^2
Daily Vapor Pressure Range	DP_V	psia	0.00508	0.00508	0.00508	0.00508	0.00400	0.00400	P_{VX} - P_{VX}
Roof Outage	H_{RO}	ft	0.00	0.00	0.00	0.00	0.00	0.00	1/3 * S_R * De/2
Vapor Space Outage	H_{VO}	ft	1.50	1.50	1.50	1.50	8.00	8.00	D/2
Working Loss Product Factor	K_E		0.055	0.055	0.055	0.055	0.055	0.055	(DT_V/T_{LA}) + (DP_V/(P_A-P_{VA}))
Vented Vapor Saturation Factor	K_S		1.00	1.00	1.00	1.00	1.00	1.00	1/(1 + 0.053 * P_{VA} * H_{VO})
Turnover Factor	K_N		0.91	1.00	0.30	0.28	0.77	0.77	turnovers < 36 = 1, turnovers > 36 = (180 + N)/6N
Working Loss Product Factor	K_P		1.00	1.00	1.00	1.00	1.00	1.00	0.75 for crude oils, 1.0 all other organic liquids
Daily Vapor Pressure Range	dPv	psia	0.005	0.005	0.005	0.005	0.004	0.004	
Vapor Space Volume	V_V	ft3	21	21	21	21	402	402	pi * (D/2)^2 * H_{VO}
Vapor Density	Wv	lb/ft3	0.00025	0.00025	0.00025	0.00025	0.00016	0.00007	(M_V * P_{VA}) / (10.731*T_{LA})
Standing Losses	L_S	lb/yr	0.1	0.1	0.1	0.1	1.3	0.6	365 * V_V * W_V * K_E * K_S
Working Losses	L_W	lb/yr	0.3	0.1	0.6	0.6	5.2	2.2	0.0010 * M_V * P_{VA} * Q/42 * K_N * K_P
Total Losses	L_T	lb/yr	0.4	0.2	0.7	0.7	6.5	2.8	L_S + L_W
Annual VOC Emission Rate		**tpy**	**0.0002**	**0.0001**	**0.0003**	**0.0004**	**0.003**	**0.001**	L_T / 2000
Working Losses at Max VP	L_W	lb/yr	0.4	0.1	2.3	2.7	8.1	3.4	0.0010 * M_V * P_{VX} * Q/42 * 1 * K_P
Max. VOC Emission Rate	$\mathbf{L_{MAX}}$	**lb/hr**	**0.0104**	**0.0104**	**0.0104**	**0.0104**	**0.1616**	**0.0688**	(L_W * $FR_{M)}$ / (N * T_{CG})

Notes:
1. Annual emission rate calculations taken from AP-42 5th Ed., Section 7.
2. Calculated using TCEQ equation from Storage Tank Guidance Document.

Table A-18. Auxiliary Boiler Emission Calculations

Las Brisas Energy Center, LLC

Emission calculations are identical for both auxiliary boilers.

EPN: AUX-BOIL1

EPN: AUX-BOIL2

Fuel Type: Natural Gas
Gross Heating Value of Fuel Gas

Combustion Calculations

Component	Fuel Gas (mol)%	Fuel Gas (wt%)	Mw	HHV (BTU/lbmol)	Fuel Molar Flowrate (lbmol/hr)	O2 Stoic. Coeff.	Oxygen Requirement (lbmol/hr)	CO2 Stoic. Coeff.	CO2 Production (lbmol/hr)	H2O Stoic. Coeff.	H2O Production (lbmol/hr)
carbon dioxide	0.48%	1.24%	44.0098	-	2.3	0	0.0	1	2.3	0	0.0
nitrogen	2.48%	4.09%	28.013	-	11.6	0	0.0	0	0.0	0	0.0
helium	0.07%	0.02%	4.0026	-	0.3	0	0.0	0	0.0	0	0.0
argon	0.02%	0.05%	39.948	-	0.1	0	0.0	0	0.0	0	0.0
hydrogen	0.04%	0.00%	2.0158	123,364	0.2	0.5	0.1	0	0.0	1	0.2
methane	93.75%	88.53%	16.0426	384,517	439.8	2	879.5	1	439.8	2	879.5
ethane	2.75%	4.87%	30.0694	680,211	12.9	3.5	45.1	2	25.8	3	38.7
propane	0.29%	0.75%	44.0962	983,117	1.4	5	6.8	3	4.1	4	5.4
propylene	0.01%	0.02%	42.0804	886,703	0.0	4.5	0.2	3	0.1	3	0.1
butane	0.03%	0.10%	58.123	1,279,191	0.1	6.5	0.9	4	0.6	5	0.7
isobutane	0.04%	0.14%	58.123	1,276,534	0.2	6.5	1.2	4	0.8	5	0.9
pentane	0.01%	0.04%	72.1498	1,524,401	0.0	8	0.4	5	0.2	6	0.28
isopentane	0.01%	0.04%	72.1498	1,521,365	0.0	8	0.4	5	0.2	6	0.28
hexane	0.02%	0.10%	86.17	1,807,569	0.1	9.5	0.9	6	0.6	7	0.66
	100.0%	100.0%		TOTALS	469		936		474		927

Average Molecular Weight= 16.99 lb/lbmol

Fuel gas HHV= 383740 BTU/lbmol 992 BTU/scf

Fuel Input

Averaging Period	Firing Duty (HHV) (MMBTU/hr)	Fuel Gas Molar Flowrate (lbmol/hr)	Fuel Gas Vol. Flowrate (scf/hr)	Fuel Gas Vol. Flowrate (scfm)
Annual	51.4	134	51,791	863
Hourly	180.0	469	181,476	3025

Annual Operating Hours	2500

Air Requirements

Composition of Air is 21% O2 and 79% N2

Assume	10% Excess Air	
O2 Flowrate=	(936 lbmol O2/hr)(1 + 0.1)=	1029 lbmol/hr
N2 Flowrate=	(1,029 lbmol/hr)(79 / 21)=	3871 lbmol/hr
Air Flowrate=	(1,029 lbmol O2/hr)(1 / 0.21)=	4900 lbmol/hr
Excess Air	=	31598 scfm

Exhaust Emissions

Component	Emission Basis			Max Hourly Emission (lb/hr)	Annual Average Emission (tpy)	Max Hourly Emission (lbmol/hr)	Conc. (% vol)
	Short Term	Annual	Units				
N2						3871	72%
O2						94	2%
H2O						927	17%
CO2						474	9%
PM10	7.6	7.6	lb/MMscf	1.38	1.72	NA	NA
VOC	5.5	5.5	lb/MMscf	1.00	1.25	0.0293	0.001%
NOx	0.035	0.035	lb/MMbtu	6.30	7.88	0.14	0.003%
CO	100	100	ppm	15.03	18.79	0.54	0.010%
SO2	0.0025	0.0025	gr H2S/dscf	0.12	0.15	0.002	0.000%
Totals						5367	

PM10 Basis: AP42-5th Section 1.4 (7/98)

VOC Basis: AP42-5th Section 1.4 (7/98)

NOx Basis: BACT

CO Basis: BACT is 100 PPM of CO

SO2 Basis: Nat. Gas

NOTE: (1) VOC concentration calculated as methane; NOx concentration calculated as NO2.

Stack Data

Parameter	Value	Unit
Height	TBD	ft. above-ground level
Diameter	TBD	ft
Exhaust Flow		acfm
Exhaust Temperature	TBD	^{o}F
Exhaust Velocity	TBD	ft/sec.

Table A-19. Propane Vaporizer Emission Calculations

Las Brisas Energy Center, LLC

Emission calculations are identical for both propane vaporizers.

EPN: PROP-VAP1

EPN: PROP-VAP2

Fuel Type: Propane

Gross Heating Value of Fuel Gas

Combustion Calculations

Component	Fuel Gas (mol)%	Fuel Gas (wt%)	Mw	HHV (BTU/lbmol)	Fuel Molar Flowrate (lbmol/hr)	O2 Stoic. Coeff.	Oxygen Requirement (lbmol/hr)	CO2 Stoic. Coeff.	CO2 Production (lbmol/hr)	H2O Stoic. Coeff.	H2O Production (lbmol/hr)
carbon dioxide	0.00%	0.00%	44.0098	-	0.0	0	0.0	1	0.0	0	0.0
nitrogen	0.00%	0.00%	28.013	-	0.0	0	0.0	0	0.0	0	0.0
helium	0.00%	0.00%	4.0026	-	0.0	0	0.0	0	0.0	0	0.0
argon	0.00%	0.00%	39.948	-	0.0	0	0.0	0	0.0	0	0.0
hydrogen	0.00%	0.00%	2.0158	123,364	0.0	0.5	0.0	0	0.0	1	0.0
methane	0.00%	0.00%	16.0426	384,517	0.0	2	0.0	1	0.0	2	0.0
ethane	0.00%	0.00%	30.0694	680,211	0.0	3.5	0.0	2	0.0	3	0.0
propane	100.00%	100.00%	44.0962	983,117	16.3	5	81.4	3	48.8	4	65.1
propylene	0.00%	0.00%	42.0804	886,703	0.0	4.5	0.0	3	0.0	3	0.0
butane	0.00%	0.00%	58.123	1,279,191	0.0	6.5	0.0	4	0.0	5	0.0
isobutane	0.00%	0.00%	58.123	1,276,534	0.0	6.5	0.0	4	0.0	5	0.0
pentane	0.00%	0.00%	72.1498	1,524,401	0.0	8	0.0	5	0.0	6	0.00
isopentane	0.00%	0.00%	72.1498	1,521,365	0.0	8	0.0	5	0.0	6	0.00
hexane	0.00%	0.00%	86.17	1,807,569	0.0	9.5	0.0	6	0.0	7	0.00
	100.0%	100.0%		**TOTALS**	**16**		**81**		**49**		**65**

Average Molecular Weight= 44.10 lb/lbmol

Fuel gas HHV= 983117 BTU/lbmol 2541 BTU/scf

Fuel Input

Averaging Period	Firing Duty (HHV) (MMBTU/hr)	Fuel Gas Molar Flowrate (lbmol/hr)	Fuel Gas Vol. Flowrate (scf/hr)	Fuel Gas Vol. Flowrate (scfm)
Annual	4.57	5	1,797	30
Hourly	16.0	16	6,296	105

Annual Operating Hours	2500

Air Requirements

Composition of Air is 21% O2 and 79% N2

Assume	10% Excess Air		
O2 Flowrate=	(81 lbmol O2/hr)(1 + 0.1)=	90	lbmol/hr
N2 Flowrate=	(90 lbmol/hr)(79 / 21)=	337	lbmol/hr
Air Flowrate=	(90 lbmol O2/hr)(1 / 0.21)=	426	lbmol/hr
Excess Air	=	2748	scfm

Exhaust Emissions

Component	Emission Basis: Short Term	Emission Basis: Annual	Emission Basis: Units	Max Hourly Emission (lb/hr)	Annual Average Emission (tpy)	Max Hourly Emission (lbmol/hr)	Conc. (% vol)
N2						337	73%
O2						8	2%
H2O						65	14%
CO2						49	11%
PM10	0.0066	0.0066	lb/MMbtu	0.11	0.13	NA	NA
VOC	0.003	0.003	lb/MMbtu	0.05	0.06	0.0014	0.000%
NOx	0.100	0.100	lb/MMbtu	1.60	2.00	0.03	0.008%
CO	100	100	ppm	1.29	1.61	0.05	0.010%
Totals						459	

PM10 Basis: AP42-5th Section 1.5 (7/96)

VOC Basis: AP42-5th Section 1.5 (7/96)

NOx Basis: BACT

CO Basis: BACT is 100 PPM of CO

NOTE: (1) VOC concentration calculated as methane; NOx concentration calculated as NO2.

Stack Data

Parameter	Value	Unit
Height	TBD	ft. above-ground level
Diameter	TBD	ft
Exhaust Flow	TBD	acfm
Exhaust Temperature	TBD	^{o}F
Exhaust Velocity	TBD	ft/sec.

Appendix B

TCEQ Table 2 – Material Balance

TABLE 2
MATERIAL BALANCE

This material balance table is used to quantify possible emissions of air contaminants and special emphasis should be placed on potential air contaminants, for example: If feed contains sulfur, show distribution to all products. Please relate each material (or group of materials) listed to its respective location in the process flow diagram by assigning point numbers (taken from the flow diagram) to each material.

LIST EVERY MATERIAL INVOLVED IN EACH OF THE FOLLOWING GROUPS	Point No. from Flow Diagram	Process Rate (lbs/hr or SCFM) standard conditions: 70°F 14.7 PSIA. Check appropriate column at right for each process.	Measurement	Estimation	Calculation
1. Raw Materials - Input					
Ammonia-Aqueous		**TBD lb/hr**		**X**	
Limestone		**TBD lb/hr**		**X**	
Steam Generator Makeup Water		**TBD lb/hr**		**X**	
Sand		**TBD lb/hr**		**X**	
2. Fuels Input					
Petroleum Coke		**892,754 lb/hr**		**X**	
3. Products & By-Products - Output					
Electricity		**1,200 MW (nominal)**		**X**	
Steam		**lb/hr**		**X**	
4. Solid Wastes - Output					
Flyash		**TBD lb/hr**		**X**	
Bottom Ash		**TBD lb/hr**		**X**	
5. Liquid Wastes - Output					
Boiler Blowdown		**TBD lb/hr**		**X**	
6. Airborne Waste (Solid) - Output					
See Table 1(a)					
7. Airborne Wastes (Gaseous) - Output					
See Table 1(a)					

NOTE:

***Above material balance is representative of expected plant operations, but is not intended to represent specific operating limitations or constraints.**

Appendix C

TCEQ Equipment Tables

TABLE 6

BOILERS AND HEATERS

Type of Device: CFB Boiler		Manufacturer: TBD		
Number from flow diagram: CFB-1, CFB-2, CFB-3, & CFB-4		Model Number: TBD		
CHARACTERISTICS OF INPUT				
Type Fuel	Chemical Composition (% by Weight)	Inlet Air Temp °F (after preheat)	Fuel Flow Rate (scfm* or lb/hr)	
Pet Coke Natural Gas Propane	See Table A-7	TBD	Average TBD	Design Maximum TBD
		Gross Heating Value of Fuel	Total Air Supplied and Excess Air	
		(specify units) 13,800 Btu/lb	Average 669,365 fm* 25% excess (vol)	Design Maximum 669,365 scfm * 25% excess (vol)

HEAT TRANSFER MEDIUM						
Type Transfer Medium	Temperature°F		Pressure (psia)		Flow Rate (specify units)	
(Water, oil, etc.)	Input	Output	Input	Output	Average	Design Maxim
TBD	TBD	TBD	TBD	TBD	TBD	TBD

OPERATING CHARACTERISTICS			
Ave. Fire Box Temp. at max. firing rate	Fire Box Volume(ft.^{3}), (from drawing)	Gas Velocity in Fire Box (ft/sec) at max firing rate	Residence Time in Fire Box at max firing rate (sec)
TBD	TBD	TBD	TBD

STACK PARAMETERS					
Stack Diameters	Stack Height	Stack Gas Velocity (ft/sec)		Stack Gas	Exhaust
		(@Ave.Fuel Flow Rate)	(@Max. Fuel Flow Rate)	Temp°F	scfm
45 ft	500 ft	16.5	16.5	175	1,311,606

CHARACTERISTICS OF OUTPUT	
Material	Chemical Composition of Exit Gas Released (% by Volume)
See Table A-5	
Attach an explanation on how temperature, air flow rate, excess air or other operating variables are controlled.	

Also supply an assembly drawing, dimensioned and to scale, in plan, elevation, and as many sections as are needed to show clearly the operation of the combustion unit.Show interior dimensions and features of the equipment necessary to calculate in performance.

*Standard Conditions: 70°F,14.7 psia

TABLE 6

BOILERS AND HEATERS

Type of Device: Auxiliary Boiler	Manufacturer: TBD
Number from flow diagram: AUX-BOIL1 & AUX-BOIL2	Model Number: TBD

CHARACTERISTICS OF INPUT

Type Fuel	Chemical Composition (% by Weight)	Inlet Air Temp °F (after preheat)	Fuel Flow Rate (scfm* or lb/hr)	
			Average	Design Maximum
Natural Gas	See Table A-18	TBD	TBD	TBD
		Gross Heating Value of Fuel (specify units)	Total Air Supplied and Excess Air	
			Average	Design Maximum
		992 btu/scf	31,958* 10% excess (vol)	31,958 scfm * 10% excess (vol)

HEAT TRANSFER MEDIUM

Type Transfer Medium (Water, oil, etc.)	Temperature°F		Pressure (psia)		Flow Rate (specify units)	
	Input	Output	Input	Output	Average	Design Maxim
TBD	TBD	TBD	TBD	TBD	TBD	TBD

OPERATING CHARACTERISTICS

Ave. Fire Box Temp. at max. firing rate	Fire Box Volume(ft.^{3}), (from drawing)	Gas Velocity in Fire Box (ft/sec) at max firing rate	Residence Time in Fire Box at max firing rate (sec)
TBD	TBD	TBD	TBD

STACK PARAMETERS

Stack Diameters	Stack Height	Stack Gas Velocity (ft/sec)		Stack Gas	Exhaust
		(@Ave.Fuel Flow Rate)	(@Max. Fuel Flow Rate)	Temp°F	scfm
TBD	TBD	TBD	TBD	TBD	TBD

CHARACTERISTICS OF OUTPUT

Material	Chemical Composition of Exit Gas Released (% by Volume)
See Table A-18	

Attach an explanation on how temperature, air flow rate, excess air or other operating variables are controlled.

Also supply an assembly drawing, dimensioned and to scale, in plan, elevation, and as many sections as are needed to show clearly the operation of the combustion unit.Show interior dimensions and features of the equipment necessary to calculate in performance.

*Standard Conditions: 70°F,14.7 psia

TABLE 6

BOILERS AND HEATERS

Type of Device: Propane Vaporizers	Manufacturer: TBD
Number from flow diagram: PROP-VAP1 & PROP-VAP2	Model Number: TBD

CHARACTERISTICS OF INPUT

Type Fuel	Chemical Composition (% by Weight)	Inlet Air Temp °F (after preheat)	Fuel Flow Rate (scfm* or lb/hr)	
			Average	Design Maximum
Propane	See Table A-19	TBD	TBD	TBD
		Gross Heating Value of Fuel (specify units)	Total Air Supplied and Excess Air	
			Average	Design Maximum
		2,541 btu/scf	2,748* 10% excess (vol)	2,748 scfm * 10% excess (vol)

HEAT TRANSFER MEDIUM

Type Transfer Medium (Water, oil, etc.)	Temperature°F		Pressure (psia)		Flow Rate (specify units)	
	Input	Output	Input	Output	Average	Design Maxim
TBD	TBD	TBD	TBD	TBD	TBD	TBD

OPERATING CHARACTERISTICS

Ave. Fire Box Temp. at max. firing rate	Fire Box Volume(ft.^{3}), (from drawing)	Gas Velocity in Fire Box (ft/sec) at max firing rate	Residence Time in Fire Box at max firing rate (sec)
TBD	TBD	TBD	TBD

STACK PARAMETERS

Stack Diameters	Stack Height	Stack Gas Velocity (ft/sec)		Stack Gas	Exhaust
		(@Ave.Fuel Flow Rate)	(@Max. Fuel Flow Rate)	Temp°F	scfm
TBD	TBD	TBD	TBD	TBD	TBD

CHARACTERISTICS OF OUTPUT

Material	Chemical Composition of Exit Gas Released (% by Volume)
See Table A-19	

Attach an explanation on how temperature, air flow rate, excess air or other operating variables are controlled.

Also supply an assembly drawing, dimensioned and to scale, in plan, elevation, and as many sections as are needed to show clearly the operation of the combustion unit.Show interior dimensions and features of the equipment necessary to calculate in performance.

*Standard Conditions: 70°F,14.7 psia

TABLE 7(a)

VERTICAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** (*Use a separate form for each tank*).
1. Applicant's Name: Las Brisas Energy Center, LLC
2. Location (*indicate on plot plan and provide coordinates*): ______
3. Tank No. TNK-ACID 4. Emission Point No. TNK-ACID
5. FIN TNK-ACID CIN ______
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]

Previous permit or exemption number(s) NA

II. ***Tank Physical Characteristics***
1. Dimensions
   a. Shell Height : 16 ft.
   b. Diameter: 8 ft.
   c. Maximum Liquid Height : 8 ft.
   d. Nominal Capacity or Working Volume: 6,016 gallons.
   e. Turnovers per year: 49.87
   f. Net Throughput : 300,000 gallons/year.
   g. Maximum Filling Rate: 6,016 gallons/hour.
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ______)
   b. Shell Condition : Good [X] Poor [ ]
   c. Roof Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ______)
   d. Roof Condition : Good [X] Poor [ ]
3. Roof Characteristics
   a. Roof Type: Dome [ ] Cone [X]
   b. Roof Height: ______ ft. (*not including shell height)*
   c. Radius (*Dome Roof Only*): ______ ft.
   d. Slope (*Cone Roof Only*): ______ ft/ft.

4. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve				
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Table 7(a) VERTICAL FIXED ROOF TANK SUMMARY
Page 2
Permit No. _______TBD__________________ Tank No. ____TNK-ACID________________

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [X] Petroleum Distillates [ ] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*

   Multiple [ ] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: Sulfuric Acid
   b. CAS Number: ___________________
   c. Average Liquid Surface Temperature: _____73_ °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: ____0.038_ psia.
   e. Liquid Molecular Weight: _94_
4. Multiple Component Information
   a. Mixture Name: ____
   b. Average Liquid Surface Temperature: ____ °F.
   c. Minimum Liquid Surface Temperature: ____ °F.
   d. Maximum Liquid Surface Temperature: ____ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: __________ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: __________ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: _________ psia.
   h. Liquid Molecular Weight: ____
   i. Vapor Molecular Weight: ____

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

TABLE 7(a)

02-95

VERTICAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** (*Use a separate form for each tank*).
1. Applicant's Name: Las Brisas Energy Center, LLC
2. Location (*indicate on plot plan and provide coordinates*): ____
3. Tank No. TNK-BASE 4. Emission Point No. TNK-BASE
5. FIN TNK-BASE CIN ____
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]

Previous permit or exemption number(s) NA

II. ***Tank Physical Characteristics***
1. Dimensions
   a. Shell Height : 16 ft.
   b. Diameter: 8 ft.
   c. Maximum Liquid Height : 8 ft.
   d. Nominal Capacity or Working Volume: 6,016 gallons.
   e. Turnovers per year: 49.87
   f. Net Throughput : 300,000 gallons/year.
   g. Maximum Filling Rate: 6,016 gallons/hour.
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ____)
   b. Shell Condition : Good [X] Poor [ ]
   c. Roof Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ____)
   d. Roof Condition : Good [X] Poor [ ]
3. Roof Characteristics
   a. Roof Type: Dome [ ] Cone [X]
   b. Roof Height: ____ ft. (*not including shell height)*
   c. Radius (*Dome Roof Only*): ____ ft.
   d. Slope (*Cone Roof Only*): ____ ft/ft.

4. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve				
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Table 7(a) VERTICAL FIXED ROOF TANK SUMMARY
Page 2
Permit No. ___TBD___ Tank No. ___TNK-BASE___

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [X] Petroleum Distillates [ ] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*

   Multiple [ ] *Complete Section III.4*

3. Single Component Information
   a. Chemical Name: Sodium Hydroxide
   b. CAS Number: ____________
   c. Average Liquid Surface Temperature: ___73___ °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: ___0.038___ psia.
   e. Liquid Molecular Weight: ___40___
4. Multiple Component Information
   a. Mixture Name: ____________
   b. Average Liquid Surface Temperature: ____ °F.
   c. Minimum Liquid Surface Temperature: ____ °F.
   d. Maximum Liquid Surface Temperature: ____ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: __________ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: __________ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: _________ psia.
   h. Liquid Molecular Weight: ____
   i. Vapor Molecular Weight: ____

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

TABLE 7(b)

HORIZONTAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** (*Use a separate form for each tank*).

1. Applicant's Name: Las Brisas Energy Center, LLC
2. Location (*indicate on plot plan and provide coordinates*): ____________
3. Tank No. **TNK-EG1 and TNK-EG2** 4. Emission Point No. **TNK-EG1 and TNK-EG2**
5. FIN **TNK-EG1 and TNK-EG2** CIN ____________
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]

Previous permit or exemption number(s) NA

II. ***Tank Physical Characteristics***

1. Dimensions
   a. Shell Length : 4.6 ft.
   b. Diameter: 3 ft.
   c. Nominal Capacity or Working Volume: 243 gallons.
   d. Turnovers per year: 11.24
   e. Net Throughput : 2,734 gallons/year.
   f. Maximum Filling Rate: 243 gallons/hour.
   g. Is the tank underground? Yes [ ] No [X]
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ___________)
   b. Shell Condition : Good [X] Poor [ ]

3. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve				
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Permit No. TBD ______ Tank No. **TNK-EG1 and TNK-EG2** ______

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [X] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*

   Multiple [ ] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: Diesel ______
   b. CAS Number: ______
   c. Average Liquid Surface Temperature: 73 °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: 0.01 psia.
   e. Liquid Molecular Weight: 188
4. Multiple Component Information
   a. Mixture Name: ______
   b. Average Liquid Surface Temperature: ______ °F.
   c. Minimum Liquid Surface Temperature: ______ °F.
   d. Maximum Liquid Surface Temperature: ______ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: ______ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: ______ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: ______ psia.
   h. Liquid Molecular Weight: ______
   i. Vapor Molecular Weight: ______

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

TABLE 7(b)

02-95

HORIZONTAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** (*Use a separate form for each tank*).

1. Applicant's Name: Las Brisas Energy Center, LLC
2. Location (*indicate on plot plan and provide coordinates*): ______
3. Tank No. TNK-FWMAIN 4. Emission Point No. TNK-FWMAIN
5. FIN TNK-FWMAIN CIN ______
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]

Previous permit or exemption number(s) NA

II. ***Tank Physical Characteristics***

1. Dimensions
   a. Shell Length : 4.6 ft.
   b. Diameter: 3 ft.
   c. Nominal Capacity or Working Volume: 243 gallons.
   d. Turnovers per year: 40.46
   e. Net Throughput : 9,841 gallons/year.
   f. Maximum Filling Rate: 243 gallons/hour.
   g. Is the tank underground? Yes [ ] No [X]
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ______)
   b. Shell Condition : Good [X] Poor [ ]

3. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve				
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Permit No. TBD Tank No. TNK-FWMAIN

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [X] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*

   Multiple [ ] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: Diesel
   b. CAS Number: ________________
   c. Average Liquid Surface Temperature: 73 °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: 0.01 psia.
   e. Liquid Molecular Weight: 188
4. Multiple Component Information
   a. Mixture Name: ________________
   b. Average Liquid Surface Temperature: __________ °F.
   c. Minimum Liquid Surface Temperature: __________ °F.
   d. Maximum Liquid Surface Temperature: __________ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: ________________ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: ________________ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: ________________ psia.
   h. Liquid Molecular Weight: ____________
   i. Vapor Molecular Weight: ____________

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

TABLE 7(b)

02-95

HORIZONTAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** (*Use a separate form for each tank*).

1. Applicant's Name: Las Brisas Energy Center, LLC
2. Location (*indicate on plot plan and provide coordinates*): ______
3. Tank No. **TNK-FWB1 through TNK-FWB4** 4. Emission Point No. **TNK-FWB1 through TNK-FWB4**
5. FIN **TNK-FWB1 through TNK-FWB4** CIN ______
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]

Previous permit or exemption number(s) NA

II. ***Tank Physical Characteristics***

1. Dimensions
   a. Shell Length : 4.6 ft.
   b. Diameter: 3 ft.
   c. Nominal Capacity or Working Volume: 243 gallons.
   d. Turnovers per year: 224.78
   e. Net Throughput : 54,674 gallons/year.
   f. Maximum Filling Rate: 243 gallons/hour.
   g. Is the tank underground? Yes [ ] No [X]
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ] Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ______)
   b. Shell Condition : Good [X] Poor [ ]

3. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve				
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Permit No. TBD Tank No. **TNK-FWB1 through TNK-FWB4**

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [X] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*

   Multiple [ ] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: Diesel
   b. CAS Number: ________________
   c. Average Liquid Surface Temperature: 73 °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: 0.01 psia.
   e. Liquid Molecular Weight: 188
4. Multiple Component Information
   a. Mixture Name: ________________
   b. Average Liquid Surface Temperature: __________ °F.
   c. Minimum Liquid Surface Temperature: __________ °F.
   d. Maximum Liquid Surface Temperature: __________ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: ________________ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: ________________ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: ________________ psia.
   h. Liquid Molecular Weight: _____________
   i. Vapor Molecular Weight: _____________

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

TABLE 7(b)

02-95

HORIZONTAL FIXED ROOF STORAGE TANK SUMMARY

I. ***Tank Identification*** (*Use a separate form for each tank*).

1. Applicant's Name: Las Brisas Energy Center, LLC
2. Location (*indicate on plot plan and provide coordinates*): ______
3. Tank No. **TNK-BFWP1 through TNK-BFWP4** 4. Emission Point No. **TNK-BFWP1 through TNK-BFWP4**
5. FIN **TNK-BFWP1 through TNK-BFWP4** ______ CIN ______
6. Status: New tank [X] Altered tank [ ] Relocation [ ] Change of Service [ ]

Previous permit or exemption number(s) NA

II. ***Tank Physical Characteristics***

1. Dimensions
   a. Shell Length : 4.6 ft.
   b. Diameter: 3 ft.
   c. Nominal Capacity or Working Volume: 243 gallons.
   d. Turnovers per year: 259.42
   e. Net Throughput : 63,100 gallons/year.
   f. Maximum Filling Rate: 243 gallons/hour.
   g. Is the tank underground? Yes [ ] No [X]
2. Paint Characteristics
   a. Shell Color/Shade : White/White [X] Aluminum/Specular [ ] Aluminum/Diffuse [ ]
   Gray/Light [ ] Gray/Medium [ ] Red/Primer [ ] Other [ ] (Describe ______)
   b. Shell Condition : Good [X] Poor [ ]

3. Breather Vent Settings				SPECIFY "Atmosphere" or Discharging to: (name of abatement device)
Valve Type	Number	Pressure Setting (psig)	Vacuum Setting (psig)	
Combination Vent Valve				
Pressure Vent Valve				
Vacuum Vent Valve				
Open Vent Valve				

Permit No. TBD Tank No. **TNK-BFWP1 through TNK-BFWP4**

III. ***Liquid Properties of Stored Material***

1. Chemical Category: Organic Liquids [ ] Petroleum Distillates [X] Crude Oils [ ]
2. Single or Multi-Component Liquid

   Single [X] *Complete Section III.3*

   Multiple [ ] *Complete Section III.4*
3. Single Component Information
   a. Chemical Name: Diesel
   b. CAS Number: ________________
   c. Average Liquid Surface Temperature: 73 °F.
   d. True Vapor Pressure at Average Liquid Surface Temperature: 0.01 psia.
   e. Liquid Molecular Weight: 188
4. Multiple Component Information
   a. Mixture Name: ________________
   b. Average Liquid Surface Temperature: __________ °F.
   c. Minimum Liquid Surface Temperature: __________ °F.
   d. Maximum Liquid Surface Temperature: __________ °F.
   e. True Vapor Pressure at Average Liquid Surface Temperature: ________________ psia.
   f. True Vapor Pressure at Minimum Liquid Surface Temperature: ________________ psia.
   g. True Vapor Pressure at Maximum Liquid Surface Temperature: ________________ psia.
   h. Liquid Molecular Weight: _____________
   i. Vapor Molecular Weight: _____________

j. Chemical Components Information

Chemical Name	CAS Number	Percent of Total Liquid Weight (typical)	Percent of Total Vapor Weight (typical)	Molecular Weight

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) Web site at www.tnrcc.state.tx.us/permitting/airperm.

1. Emission Point Number and name (from Process Flow Diagram): See Table 1(a)				
2. Manufacturer and model number (if available): TBD				
3. Name of source(s) or equipment being controlled: TBD				
4. Type of particulate controlled: TBD				
5. **GAS STREAM CHARACTERISTICS**				
Design Maximum Flow Rate (acfm)	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
TBD	TBD	TBD	Inlet: TBD	Outlet: 0.01
Pressure Drop (inches of H_2O)	Water Vapor Content of Effluent Stream (lb water/lb dry air)		Fan Requirements	
TBD	TBD		hp: TBD	ft^3/min: TBD

6. **PARTICULATE DISTRIBUTION (By Weight)**		
Micron Range	Inlet (Percentage)	Outlet (Percentage)
0.0-0.5	TBD	TBD
0.5-1.0	TBD	TBD
1.0-5.0	TBD	TBD
5-10	TBD	TBD
10-20	TBD	TBD
over 20	TBD	TBD

7. **FILTER CHARACTERISTICS**			
Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags
TBD	TBD	TBD	TBD
8. Bag rows will be: ❑ Staggered ❑ Straight			
9. Will walkways be provided between banks of bags?: ❑ YES ❑ NO			
10. Filtering material: TBD			
11. Describe bag cleaning method and cycle.: TBD			
12. Capital installed cost $______TBD__________		Annual operating cost $______TBD___________	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Table 29
RECIPROCATING ENGINES

ENGINE DATA

EPN From Table 1(a) **ENG-EG1 & ENG-EG2**

APPLICATION

- ____ Gas Compression
- **X** Electric Generation
- ____ Refrigeration
- ____ Other (Specify) ____

Manufacturer ____
Model No. ____
Serial No. ____
Orig. Mfr. Date **NEW**
Rebuild Date(s) **N/A**
No. of Cylinders ____
Compression Ratio ____

X 4 Stroke Cycle ____ Carburetted ____ Spark Ignited ____ Dual Fuel
____ 2 Stroke Cycle ____ Fuel Injected **X** Diesel

Naturally Aspirated ____ Blower/Pump Scavenged ____ Turbocharged & I.C. ____
Turbocharged ____ Intercooled (I.C.) ____ I.C. Water Temperature ____

Ignition/Injection Timing: ____ Fixed ____ Variable

	Mfg. Rating	Proposed Operating Range
Horsepower	**2,309 HP**	**2,309 HP**
Speed (rpm)		

FUEL DATA

____ Field Gas ____ Landfill Gas ____ LP Gas ____ Other
____ Natural Gas ____ Digester Gas **X** Diesel

Engine Fuel Consumption ____ BTU/bhp-hr
Heat Value (specify units) **19,236 Btu/lb** (HHV) (LHV)
Fuel Sulfur Content **0.05** (granins/100 scf)(weight percent)

FULL LOAD EMISSIONS DATA

No_x ____ g/bhp-hr CO ____ g/bhp-hr
____ ppmv ____ ppmv
$VOC(C_3^+)$ ____ g/bhp-hr Total HC ____ g/bhp-hr
____ ppmv ____ ppmv

Attach information showing emissions versus engine speed and load.

Method of Emissions Control:

____ Lean Operation ____ Parameter Adjustment ____ SCR Catalyst
____ Stratified Charge ____ NSCR Catalyst ____ Other (Specify) ____

ADDITIONAL INFORMATION

On separate sheets attach the following:

A. A copy of engine manufacturer's site rating or general rating specification for the engine model.
B. Tyical fuel analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
C. Description of air/fuel ratio control system (manufacturers's information acceptable).
D. Details regarding principle of operation of emissions controls. If add-on equipment is used, provide make and model and manufacturer's information.
E. Exhaust parameter information on Table 1(a).

Table 29
RECIPROCATING ENGINES

ENGINE DATA

EPN From Table 1(a) **ENG-FWMAIN**

APPLICATION

___ Gas Compression
___ Electric Generation
___ Refrigeration
X Other (Specify) **Pump Driver**

Manufacturer ___
Model No. ___
Serial No. ___
Orig. Mfr. Date **NEW**
Rebuild Date(s) **N/A**
No. of Cylinders ___
Compression Ratio ___

X 4 Stroke Cycle ___ Carburetted ___ Spark Ignited ___ Dual Fuel
___ 2 Stroke Cycle ___ Fuel Injected X Diesel

Naturally Aspirated ___ Blower/Pump Scavenged ___ Turbocharged & I.C. ___
Turbocharged ___ Intercooled (I.C.) ___ I.C. Water Temperature ___

Ignition/Injection Timing: ___ Fixed ___ Variable

	Mfg. Rating	Proposed Operating Range
Horsepower	**360 HP**	**360 HP**
Speed (rpm)		

FUEL DATA

___ Field Gas ___ Landfill Gas ___ LP Gas ___ Other
___ Natural Gas ___ Digester Gas X Diesel

Engine Fuel Consumption ___ BTU/bhp-hr
Heat Value (specify units) **19,236 Btu/lb** (HHV) (LHV)
Fuel Sulfur Content **0.05** (granins/100 scf)(weight percent)

FULL LOAD EMISSIONS DATA

NO_x ___ g/bhp-hr CO ___ g/bhp-hr
___ ppmv ___ ppmv
VOC(C_3^+) ___ g/bhp-hr Total HC ___ g/bhp-hr
___ ppmv ___ ppmv

Attach information showing emissions versus engine speed and load.

Method of Emissions Control:
___ Lean Operation ___ Parameter Adjustment ___ SCR Catalyst
___ Stratified Charge ___ NSCR Catalyst ___ Other (Specify) ___

ADDITIONAL INFORMATION

On separate sheets attach the following:

A. A copy of engine manufacturer's site rating or general rating specification for the engine model.
B. Tyical fuel analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
C. Description of air/fuel ratio control system (manufacturers's information acceptable).
D. Details regarding principle of operation of emissions controls. If add-on equipment is used, provide make and model and manufacturer's information.
E. Exhaust parameter information on Table 1(a).

Table 29
RECIPROCATING ENGINES

ENGINE DATA

EPN From Table 1(a) **ENG-FWB1 through ENG-FWB4**

Manufacturer ________
Model No. ________
Serial No. ________
Orig. Mfr. Date **NEW**
Rebuild Date(s) **N/A**
No. of Cylinders ________
Compression Ratio ________

APPLICATION

____ Gas Compression
____ Electric Generation
____ Refrigeration
X Other (Specify) **Pump Driver**

X 4 Stroke Cycle ____ Carburetted ____ Spark Ignited ____ Dual Fuel
____ 2 Stroke Cycle ____ Fuel Injected **X** Diesel

Naturally Aspirated ____ Blower/Pump Scavenged ____ Turbocharged & I.C. ____
Turbocharged ____ Intercooled (I.C.) ____ I.C. Water Temperature ____

Ignition/Injection Timing: ____ Fixed ____ Variable

	Mfg. Rating	Proposed Operating Range
Horsepower	**100 HP**	**100 HP**
Speed (rpm)		

FUEL DATA

____ Field Gas ____ Landfill Gas ____ LP Gas ____ Other
____ Natural Gas ____ Digester Gas **X** Diesel

Engine Fuel Consumption ________ BTU/bhp-hr
Heat Value (specify units) **19,236 Btu/lb** (HHV) (LHV)
Fuel Sulfur Content **0.05** (granins/100 scf)(weight percent)

FULL LOAD EMISSIONS DATA

No_x ________ g/bhp-hr CO ________ g/bhp-hr
________ ppmv ________ ppmv
VOC(C_3^+) ________ g/bhp-hr Total HC ________ g/bhp-hr
________ ppmv ________ ppmv

Attach information showing emissions versus engine speed and load.

Method of Emissions Control:

____ Lean Operation ____ Parameter Adjustment ____ SCR Catalyst
____ Stratified Charge ____ NSCR Catalyst ____ Other (Specify) ________

ADDITIONAL INFORMATION

On separate sheets attach the following:

A. A copy of engine manufacturer's site rating or general rating specification for the engine model.
B. Tyical fuel analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
C. Description of air/fuel ratio control system (manufacturers's information acceptable).
D. Details regarding principle of operation of emissions controls. If add-on equipment is used, provide make and model and manufacturer's information.
E. Exhaust parameter information on Table 1(a).

Table 29
RECIPROCATING ENGINES

ENGINE DATA

EPN From Table 1(a) **ENG-BFWP1 through ENG-BWFP4**

APPLICATION

____ Gas Compression
____ Electric Generation
____ Refrigeration
X Other (Specify) **Pump Driver**

Manufacturer ________
Model No. ________
Serial No. ________
Orig. Mfr. Date **NEW**
Rebuild Date(s) **N/A**
No. of Cylinders ________
Compression Ratio ________

X 4 Stroke Cycle ____ Carburetted ____ Spark Ignited ____ Dual Fuel
____ 2 Stroke Cycle ____ Fuel Injected **X** Diesel

Naturally Aspirated ____ Blower/Pump Scavenged ____ Turbocharged & I.C. ____
Turbocharged ____ Intercooled (I.C.) ____ I.C. Water Temperature ____

Ignition/Injection Timing: ____ Fixed ____ Variable

	Mfg. Rating	Proposed Operating Range
Horsepower	**2,000 HP**	**2,000 HP**
Speed (rpm)		

FUEL DATA

____ Field Gas ____ Landfill Gas ____ LP Gas ____ Other
____ Natural Gas ____ Digester Gas **X** Diesel

Engine Fuel Consumption ____ BTU/bhp-hr
Heat Value (specify units) **19,236 Btu/lb** (HHV) (LHV)
Fuel Sulfur Content **0.05** (granins/100 scf)(weight percent)

FULL LOAD EMISSIONS DATA

No_x ____ g/bhp-hr CO ____ g/bhp-hr
____ ppmv ____ ppmv
VOC(C_3^+) ____ g/bhp-hr Total HC ____ g/bhp-hr
____ ppmv ____ ppmv

Attach information showing emissions versus engine speed and load.

Method of Emissions Control:

____ Lean Operation ____ Parameter Adjustment ____ SCR Catalyst
____ Stratified Charge ____ NSCR Catalyst ____ Other (Specify)
____

ADDITIONAL INFORMATION

On separate sheets attach the following:

A. A copy of engine manufacturer's site rating or general rating specification for the engine model.
B. Tyical fuel analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
C. Description of air/fuel ratio control system (manufacturers's information acceptable).
D. Details regarding principle of operation of emissions controls. If add-on equipment is used, provide make and model and manufacturer's information.
E. Exhaust parameter information on Table 1(a).