PRELIMINARY DETERMINATION SUMMARY

Las Brisas Energy Center, LLC
Permit Nos. 85013, HAP48, PAL41, and PSD-TX-1138

I. APPLICANT

Las Brisas Energy Center LLC (LBEC)
11011 Richmond Avenue, Suite 350
Houston, Texas 77042

II. PROJECT LOCATION

The Las Brisas Energy Center (LBEC) is located at 6059 Joe Fulton Corridor, Corpus Christi, Nueces County, Texas.

III. PROJECT DESCRIPTION

LBEC proposes to construct and operate new steam-electric utility generating facilities using four circulating fluidized bed (CFB) boilers, each with a design maximum heat input of 3,080 million British thermal units per hour (MMBtu/hr) and 300 MW net electric output. The gross electric output of the four steam electric generators is about 1,400 MW; the net electric output of the LBEC is about 1,200 MW. The proposed fuel is petroleum coke. The project is sized with the capability to take all the petroleum coke produced by the Corpus Christi petroleum refineries, located nearby along the Corpus Christi Ship Channel. Natural gas is proposed as the CFB startup fuel, with vaporized propane as a back-up startup fuel if natural gas is unavailable.

Air pollutant-emitting equipment necessary for supporting the operation of the CFBs and steam turbine generators is included in the draft air permit. Combustion-type facilities include: two auxiliary boilers, used to provide process steam during CFB startups, shutdowns, and during the commissioning phase of the project (the last phase of construction); two propane vaporizers to vaporize the propane back-up fuel; and eleven diesel engines to provide, variously, emergency electric generation, firefighting water pumping capability, and emergency boiler feed water pumping capability. Each auxiliary boiler and propane vaporizer will be limited to operate no more than 2,500 hours per year; each engine, no more than 500 hours per year.

The steam-electric generation process requires that the steam circulated in the boiler-steam turbine loop be condensed to water before being pumped up to operating pressure and returned to the boiler. LBEC proposes two water-cooled cooling towers, each with a cooling water circulation design rate of 300,000 gallons per minute.

The permit includes vessels used to hold solids: the petroleum coke fuel; limestone and lime

for sulfur dioxide (SO_2) control; soda ash for water quality treatment; sand for CFB bed stabilization; and fly ash and boiler bottom ash solid wastes. The materials stored in these silos or bins are moved pneumatically, and fabric filters, (also called baghouses), are used to clean the exhaust emissions from these facilities.

Eleven liquid fuel storage tanks are proposed for storing diesel fuel for the emergency engines, and one tank each for acid and base water treatment chemicals. Pressurized storage tanks are proposed to store ammonia, used for nitrogen oxides (NO_X) control, and the propane fuel.

IV. EMISSIONS

Proposed site-wide maximum annual emissions, in tons per year (tpy), of NO_X, carbon monoxide (CO), SO_2, particulate matter (PM), PM less than or equal to 10 microns in diameter (PM_{10}), volatile organic compounds (VOC), and lead (Pb)are summarized in the following table. Emissions of PM_{10} are that portion of the PM emissions with average particle diameter less than or equal to 10 microns. The pollutants in Table IV(A) are referred to as "criteria" pollutants, because the United States Environmental Protection Agency (EPA) has established ambient air quality emission limits for these pollutants, either directly, or in the case of VOC, for ozone, which is a reaction byproduct of VOC and NO_X in the presence of sunlight. The second row of numbers in Table IV(A) are the corresponding Prevention of Significant Deterioration (PSD) significant emission levels in tons per year (tpy).

Table IV(A): Criteria pollutant emissions, and PSD significant levels, in tons per year

NO_X	CO	SO_2	PM/PM_{10}	VOC	Pb
3,824	5,977	8,096	1,767/1,664	283	0.05
40	100	40	25/15	40	0.60

Annual potential emissions of other pollutants are identified in the following table. Federally regulated new source review (NSR) pollutants' PSD significant levels, in tpy, are identified in the second row of the table. Sulfuric Acid Mist (H_2SO_4) is both a PSD pollutant by itself, and a component of PM/PM_{10} emissions.

Table IV(B): Other air pollutant, tons per year

	H_2SO_4	Fluorides, as Hydrogen Fluoride (HF)	Ammonia (NH_3)	Hydrogen Chloride (HCl)	Mercury (Hg)
Proposed emissions	1,025	4.4	141	47.9	0.11
PSD significant emission	7	3	Not PSD	Not PSD	Not PSD

V. PSD AND NONATTAINMENT APPLICABILITY

Nueces County, where the LBEC will be located, is classified as "unclassifiable/attainment" or "better than national standards" for the six criteria air pollutants -- SO_2, CO, Pb, PM_{10}, NO_2, and ozone -- as listed by the EPA in Title 40 Code of Federal Regulations, Part 81.344. Because the ambient air in the county is considered to attain the EPA national ambient air quality standards (NAAQS), federal nonattainment permit review does not apply.

A federal PSD permit review is required for the LBEC. PSD applies to major new sources/modifications of emissions located in attainment areas. The purpose of PSD is to prevent areas with clean air from degrading to the limit of the NAAQS, and is primarily accomplished by requiring best available control technology (BACT) to the control of significant emissions at major new sources or modifications of existing major sources, and projected compliance with ambient pollution "increments" which are set at lower levels than the NAAQS. The LBEC is a major new source, under Category 1 (fossil fuel-fired steam electric plants of more than 250 MMBtu/hr heat input) of the 28 named PSD source categories. For named source categories, emissions of 100 tpy of any new federally regulated NSR pollutant is the threshold for classification as a "major" source. As shown in Table IV(A), emissions of all criteria pollutants are over 100 tpy (as well as the significant emission levels), except Pb. Emissions of Pb are below the PSD significant level of 0.6 tpy, while proposed emissions of the federally regulated NSR pollutant HF and H_2SO_4 are above their respective PSD-defined significant levels identified in Table IV(B). PSD review is required for SO_2, CO, PM/PM_{10}, NO_x, VOC, fluorides, and H_2SO_4. For Pb, permit review is required under the state permit requirements, not PSD.

VI. CONTROL TECHNOLOGY - Best Available Control Technology (BACT)

A. CFB Boilers

State and federal law require application of BACT for the control of air emissions from LBEC. BACT requires consideration of both technical feasibility and economic reasonableness. To identify BACT, the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) staff follow air pollution technology development for coal combustion through review of recently issued air permits issued around the country, attendance at workshops and conferences, interaction with vendor experts, state and federal regulators, plant tours, etc. In the last five years, many new solid fossil-fuel-fired power plant have been proposed in the United States, with many air permits already issued and others still under review. In its evaluation, the APD compared the proposed LBEC emissions with several recently proposed and issued permits to identify proposed BACT technologies and emission limits. In addition, the EPA's acid rain program generates unit-specific SO_2 and NO_x monitoring data which allows evaluation of current emission rates for similar electric generating facilities operating in the United States. This information may be used to assess performance of SO_2 and NO_x pollution controls.

The following table summarizes the proposed emission limits expressed as performance standards for the CFB boilers.

Pollutant	Emission Rate (lb/MMBtu)	Averaging time
NO_x	0.10	hourly
NO_x	0.070	30-day rolling
SO_2	0.178	30-day rolling
SO_2	0.15	12-month-rolling
CO	0.11	12-month rolling
PM/PM_{10} total	0.033	annual
PM/PM_{10} filter	0.011	annual
Pb	0.00000095	annual
VOC	0.0050	annual
Fluorides (as HF)	0.000082	annual
HCl	0.00089	annual
Pollutant	Emission Rate (lb/MMBtu)	Averaging time
H_2SO_4	0.022	annual

Mercury	0.0000020	12-month rolling
	not lb/MMBtu	
Ammonia	10 ppm	3-hour
Ammonia	5 ppm	12-month rolling

NO_X For NO_x, the proposed hourly BACT limit requires use of combustion controls, including low NO_x burners and over-fired air. The proposed 30-day limit requires selective non-catalytic reduction (SNCR), which consists of NH_3 injection into the upper furnace where the ammonia reacts with NO_X to form nitrogen and water. Selective catalytic reduction (SCR), which uses a catalyst bed to promote the ammonia-NO_X reactions at lower temperatures than are in the upper furnace, was investigated as a potentially more effective control technology. The use of SCR was rejected for the CFBs because in the flue gases exiting the boiler economizer, where SCR is normally installed on pulverized-coal (PC) boilers, the fly ash (particulate matter) properties in a CFB are very different from a PC boiler. The CFB fly ash mass loading is higher, the particle size is larger, and the calcium oxide content of the particulate is higher than any PC boiler using SCR. These lead to technical concerns as to whether the SCR would be able to withstand plugging and premature deactivation; SCR vendors are not willing to guarantee the performance of their catalysts on a petroleum coke-fired CFB at this time. No coal or petroleum coke fired CFBs are known to have used SCR. The use of SCR was rejected as BACT for the CFBs because it has not been shown to be technically feasible.

The TCEQ follows the EPA requirement that the PSD BACT determination consider the most stringent level of BACT that has been established for a similar facility. As part of the BACT evaluation, the EPA's data base of BACT determinations, the RACT-BACT-LAER Clearinghouse, was searched for solid-fuel boilers rated greater than 250 MMBtu/hr heat input. The emission limit of 0.070 lb NO_X/MMBtu, 30-day rolling average was the most stringent limit found for petroleum coke or coal-fired CFBs. Therefore, the proposed control technology and emission limit of 0.070 lb NO_X/MMBtu is BACT for LBEC's proposed petroleum coke-fired CFBs.

SO_2 For SO_2 control, LBEC proposes to use two control systems. First, the CFB bed will be composed primarily of limestone, which decomposes, or calcines, upon heating, to form lime, which in turn reacts to form gypsum with the SO_2 and SO_3 released from the burning petroleum coke. With control efficiencies in the 90%-98% range, this "in-process" control

gives CFBs a cost advantage over PC boilers that use the more capital, energy, and water-intensive, wet flue gas desulfurization (FGD) systems at the tail end of the process. A wet FGD may now achieve 98%-99% removal efficiency as BACT for SO_2. Recent designs of coal and coke-fired CFBs have included tail end SO_2 cleanup in addition to the limestone bed control. LBEC proposes to use a lime slurry injected into the flue gas stream before it enters the PM collection system to remove additional SO_2 from the flue gas This type of control is called a dry FGD system (or lime spray dryer), because the gypsum product is collected as a dry powder with the PM (flyash), rather than a scrubber sludge in wet FGD.

The proposed SO_2 emission limits for LBEC are consistent with the most stringent SO_2 emission limits of other recently issued permits for very similar facilities and fuels. The TCEQ recently issued an air quality permit for Calhoun County Navigation District's proposed 100% petroleum coke-fired CFB, of the same size, and using the same control technology as proposed by LBEC, with an emission limit of 0.178 lb SO_2/MMBtu, 30-day rolling average. The EPA's RBLC data base lists three petroleum coke-fired CFB projects of similar size and using the same control technology as proposed by LBEC, with an emission limit of 0.15 lb SO_2/MMBtu, rolling 30-day average: Big Cajun I, a 240 MW unit permitted in 2008 but not under construction, owned by NRG Louisiana; Rodemacher Unit 3, consisting of two 300 MW units under construction, owned by CLECO; and Northside CFB Units 1 and 2, also two 300 MW units, operating since 2002, owned by JEA. A distinguishing feature of the three projects permitted at 0.15 lb SO_2/MMBtu is that although there is some evidence that they were designed to achieve this limit on 100% petroleum coke with the same or similar sulfur content, each of them is designed and permitted to burn lower sulfur fuel than petroleum coke. The only plant of the three already in operation, JEA Northside, normally operates with a blend of 90% petroleum coke and 10% bituminous coal. Therefore, each of the these plants has the ability to blend the fuel to reduce SO_2 emissions on a 30-day rolling average, whereas LBEC does not. Because of this reduced flexibility for LBEC, emission limits of 0.178 lb SO_2/MMBtu, 30-day rolling average, and 0.15 lb SO_2/MMBtu, rolling 12-month average, are BACT for the SO_2 emissions from the proposed LBEC CFBs.

CO and VOC For CO and VOC, LBEC proposes good combustion practice and boiler design to minimize these products of incomplete combustion, which is consistent with the technology approved for other CFB permits around the country.

The proposed LBEC performance standard for CO, 0.011 lb CO/MMBtu, 30-day rolling average, is similar, but not identical to the most stringent performance standards of other similar CFB permits. The PDS for Rodemacher 3 in Louisiana describes performance at 0.10 lb CO/MMBtu, 30-day rolling average for CFB loads at or near full load and 0.15 lb CO/MMBtu for loads at 75% or less. The Rodemacher 3 permit includes only the 0.15 lb

CO/MMBtu performance standard, while the allowable annual tons are calculated on 0.10 lb/MMBtu. Two more recent petroleum coke fueled CFB projects in Louisiana, Rodemacher 3, and Entergy's Little Gypsy 3, have permit performance standards of 0.10 lb CO/MMBtu, 30-day rolling average for loads at or greater than 60%, and 0.15 lb CO/MMBtu, 24-hour rolling average, for loads at 60% or less. A PSD permit was issued in June 2008 for VEPCO's Virginia City Hybrid Energy Center (VCHEC), a MW bituminous coal, coal waste, and biomass-fired CFB, with a single variable CO performance standard based on 0.10 lb/MMBtu for load equal to or greater than 75% for and 0.15 lb/MMBtu for loads less 75% and weighted according to the amount of time operating within each range. It is not clear whether any of these limits are more stringent than the proposed limit for LBEC.

The proposed emissions of VOC are fairly consistent with other recent permits. The proposed LBEC performance standard is 0.0050 lb VOC/MMBtu, annual average. Other recent petroleum coke-fired CFB permit limits include: Entergy Little Gypsy, NRG Cajun I, and CLECO Rodemacher 3, all in Louisiana, each with a performance standard of 0.0047 lb/MMBtu, 30-day rolling average; and JEA Northside, 0.0050 lb/MMBtu, 3-hr average. Various other recent coal-fired CFB projects have a permit limit of 0.0050 lb/MMBtu, 3-hr average, including: VEPCO VCHEC, Sunnyside Ethanol, LLC, River Hill Power Company, Greene Energy Resource Recovery Project, and Gascoyne Generating Station. The proposed emissions of CO and VOC reflect application of BACT.

PM/PM_{10} For PM/PM_{10}, filter catch, LBEC proposes to use a fabric filter baghouse as BACT. The proposed performance standard of 0.011 lb PM filterable/MMBtu is fairly consistent with the lowest of recent proposed permits for CFBs in the U.S. The most recent permit in the RBLC data base, VEPCO's VCHEC, has limits of 0.010 lb filterable PM/MMBtu, 3-hr average. In addition, this permit requires a PM CEMS, and specifies a limit of 0.009 lb PM/MMBtu, 30-day rolling average with compliance based on the CEMS. Three permits issued for CFBs in Pennsylvania, Reliant Seward Power, Sunnyside Ethanol, and River Hill Power, have a limit of 0.01 lb filterable PM/MMBtu, 3-hr average. Because the Pennsylvania permits did not include a trailing zero after the limit, it has been pointed out that compliance with the PM filterable performance standard would be established by any test value below 0.015 lb/MMBtu, based on appropriate rounding. In addition, none of the preceding projects are based on petroleum coke fuel. The petroleum coke-fired CFB air permits, JEA Northside, NRG Big Cajun I, Entergy Little Gypsy, and CLECO Rodemacher all have limits of 0.011 lb PM filterable/MMBtu, 30-day average. Because the LBEC CFBs are to use petroleum coke, the slightly higher limit of the petroleum coke projects is the appropriate choice for filterable PM BACT.

The total PM/PM_{10} reflects the contribution of condensables, or so-called back half catch, and includes H_2SO_4 and HCl. The calcium in the limestone combustion bed, flue gas, spray dryer chamber, and baghouse is expected to absorb much of the acid gases. Establishing the

condensable portion of PM is complicated because the quantification of H_2SO_4 and other condensing species is difficult and some test results using EPA test methods for condensables have produced questionable results. The proposed control technology and emission limits of 0.011 lb PM filterable/MMBtu and 0.033 lb total PM/MMBtu, three-hour average, represent BACT.

H_2SO_4 and Fluorides For the acid gases H_2SO_4 and HF, LBEC proposes control with a limestone bed CFB, lime spray dryer, and baghouse with 95% average removal efficiency and proposed emission limits of 0.022 lb H_2SO_4/MMBtu, 3-hour average, 0.019 lb H_2SO_4/MMBtu, annual average, and 0.000082 lb HF/MMBtu. The emission limits reflect BACT.

BACT for Emissions during Startup/Shutdown The flue gas emission control systems for NO_X and SO_2 require minimum operating temperatures in order to operate. The maximum hourly BACT emission rates for CFB Boiler Startup/Shutdown emissions, reflecting these operating temperature limitations, are identified in the permit maximum allowable emission rate table. These operating conditions do not increase allowable tons per year of emissions. The baghouse needs to be preheated before introducing the flue gases from petroleum coke combustion. This preheating will be done with natural gas or propane, which produce very little PM. In order to assure maximum control of PM during startups and shutdowns, if bypass ductwork is constructed, the baghouses will not be bypassed while firing petroleum coke. In addition to this measure, the applicant has agreed to develop a written plan to minimize emissions during startups and shutdowns. BACT is applied for CFB S/S.

BACT for Non-federally regulated NSR Pollutants The introduction of ammonia for NO_X control may result in some emissions of ammonia, because at higher NO_X reductions, some ammonia may slip through the reaction zone without reacting with NO_X. Ammonia slip is limited to 10 ppmv on an hourly basis and 5 ppmv on an annual basis. These limits are consistent with other permit and regulatory limits for ammonia and reflect BACT.

For nonmercury metals, the baghouse PM/PM_{10} emission limit provides BACT level control of these solid materials. For mercury, the applicant proposes to use activated carbon injection as necessary, to meet an emission limit of $2.0(10^{-6})$ lb/MMBtu, on a 12-month rolling average, to be verified by continuous emission monitors. In addition, LBEC will conduct an optimization program to maximize the Hg removal. The degree of Hg removal will depend on the Hg input through the fuel; more recent data, such as measured at JEA Northside, suggests that there is very little Hg in the petroleum coke. For HCl, an acid gas, the limestone bed CFB, lime spray dryer, and baghouse with 95% average removal efficiency and proposed emission limit of 0.00089 lb HCl/MMBtu, annual average, reflect BACT.

B. Auxiliary Boilers

The two proposed natural gas-fired boilers, each rated at 180 MMBtu/hr of heat input, are limited by permit condition to operate no more than 2,500 hours per rolling 12-month period. The applicant proposes to control emissions of NO_X to 0.035 lb NO_X/MMBtu (~29 parts per million by volume, dry basis, at 3% O_2) and CO to 50 ppmvd, 3% O_2 (0.037 lb CO/MMBtu),. Typically, a combination of flue gas recirculation, low-NO_X burners, and tight air-fuel ratio control are used to achieve these limits. Because of the limited operation of the auxiliary boilers, and the resulting relatively high marginal costs of additional control, it is not necessary to meet the TCEQ BACT guidance of 0.010 lb NO_X/MMBtu (8 ppmvd @ 3% O_2) for natural gas-fred boilers above 40 MMBtu/hr with unrestricted hours of operation. The CO limit of 50 ppmvd at 3% O_2 is the TCEQ BACT guidance level for CO for natural gas-fired boilers. The use of pipeline natural gas constitutes BACT for SO_2, PM, and VOC. Proposed emissions are based on AP-42 emissions for PM and VOC, and 0.25 grain hydrogen sulfide per 100 scf of natural gas for SO_2. Combined annual allowable emissions from the two auxiliary boilers are: 16 tpy NO_X, 19 tpy CO, 3.4 tpy PM_{10}, 2.5 tpy VOC, and 0.3 tpy SO_2.

C. Propane Vaporizers

The two proposed propane-fired vaporizers, each rated at 16 MMBtu/hr of heat input, are limited by permit condition to operate no more than 2,500 hours per rolling 12-month period. The applicant proposes to control emissions of NO_X and CO to 0.10 lb NO_X/MMBtu (82 parts per million by volume, dry basis, at 3% O_2) and ~0.040 lb CO/MMBtu (50 ppmvd, 3% O_2), respectively. Typically, no special burner design is required to meet these limits. Based on a discussion with the proposed vaporizer vendor, there are no low-NO_X burners available for these particular units at this size. Because of the limited operation of the propane vaporizers and the apparent lack of a readily available low-NO_X burner design suitable for these units, BACT is applied for NO_X control with no additional control. The CO limit of 50 ppmvd 3% O_2 is BACT for CO. The use of propane fuel gas constitutes BACT for SO_2, PM, and VOC. Proposed emissions are based on AP-42 emissions for PM, VOC, and SO_2. Combined annual allowable emissions from the two propane vaporizers are: 4.0 tpy NO_X, 3.2 tpy CO, 0.30 tpy PM_{10}, 0.34 tpy VOC, and 0.1 tpy SO_2.

D. Diesel Engines

The eleven emergency diesel engines have output ratings as follows: 2 generators - 1,600 kW electric each; - 1 fire water pump engine - 360 horsepower (hp); 4 booster fire water pump engines - 100 hp each; and 4 boiler feed water pumps - 2,000 hp each. The proposed maximum usage of each engine is limited to 500 hours per year. The engines are required to meet EPA's recently adopted NSPS Subpart IIII for stationary diesel engines, which also limits the sulfur content of the diesel fuel. Based on the limited hours of operation,

compliance with the NSPS represents BACT for these engines.

E. Cooling Towers

The proposed cooling towers, used to remove waste heat from the steam electric generation process, will be a source of PM/PM_{10} emissions caused by the evaporation of water mist that contains dissolved solids. Dissolved solids become solid airborne particulate when the droplet dries. The method of controlling these emissions is to use high-efficiency drift eliminators to knock out water particles that contain the dissolved solids. The applicant proposes to use high efficiency mist eliminators with a drift rate (lb water drift emission/lb circulated water) of 0.0005%. This rate represents BACT for the control of PM/PM_{10} from the cooling towers. Total proposed emissions are 105 tpy PM and 2.6 tpy PM_{10}.

F. Material Storage and Handling Equipment

LBEC proposes to control PM/PM_{10} from the material storage and handling operations by using enclosed conveyors to bring the petroleum coke into the plant, pneumatic piping for solids conveying, and baghouses to control air vent emissions. The baghouses are specified to meet an emission limit of 0.01 grain PM/dscf for the low-flow baghouses, and 0.005 grain PM/dscf for the high-flow baghouses (ash and petroleum coke). There will be no open storage of solids on the plant property. These levels of control represent BACT for the emissions from the solid material storage and handling equipment.

LBEC proposes to use pressurized storage tanks for storage of propane and ammonia. The only emissions associated with these tanks are very small amounts of fugitive emissions that escape from connections and seals. LBEC will use an audio/visual/olfactory leak detection program to ensure that fugitive leaks from the ammonia storage tanks are minimized. This level of control represents BACT for the pressurized storage tanks.

VII. AIR QUALITY ANALYSIS FOR COMPLIANCE WITH NAAQS

Air dispersion modeling using the AMS/EPA Regulatory Model (AERMOD) version 07026 was performed in accordance with TCEQ and EPA guidelines. For each criteria pollutant subject to PSD NAAQS review, a modeling significance analysis was conducted to determine if a full impact analysis would be required. The EPA has repealed the NAAQS for PM in general, or all sizes of PM, in order to focus on small PM, such as PM_{10} and $PM_{2.5}$. Similarly, the TCEQ has repealed its former emission standards for Total Suspended Particulates. Because there are no standards for PM or TSP, modeling of PM was conducted only for PM_{10} emissions. Similarly, although EPA has established a NAAQS for $PM_{2.5}$, it has not yet

established procedures for modeling secondary, or indirectly formed $PM_{2.5}$, and has not set levels for PSD significant impact or increment for $PM_{2.5}$. EPA recommends using the PSD modeling evaluation for PM_{10} as a surrogate for compliance with $PM_{2.5}$. If the modeling evaluation predicts compliance with the PM_{10} NAAQS and increments, compliance with the $PM_{2.5}$ NAAQS and (future) increment standards is presumed.

The maximum contribution, or impact, of the proposed criteria pollutant emissions from the LBEC alone, at specific off-property, ground-level location is shown in the following table. The applicant's modeling report identifies these locations, which vary, depending on averaging time and pollutant. Insignificant, or de minimis impacts, do not require evaluating other sources in the area. If the project's impacts are de minimis, they don't threaten the NAAQS or PSD increments. The modeling results indicate that the project impacts are de minimis for CO, and significant for NO_2, PM_{10}, and SO_2:

Modeling Results for PSD NAAQS Area of Significant Impact (AOI)			
Pollutant	Averaging Time	GLCmax ($\mu g/m^3$)	De Minimis ($\mu g/m^3$)
CO	1-hr	780	2,000
	8-hr	120	500
NO_2	Annual	4.5	1
PM_{10}	24-hr	21	5
	Annual	3.9	1
SO_2	3-hr	120	25
	24-hr	37	5
	Annual	3.9	1

The significant impacts for NO_2, PM_{10}, and SO_2 shown in the above table require modeling of other point sources and factoring in the contribution from mobile and area sources--a full impact analysis to assess predicted compliance with the NAAQS and PSD increments. A point source inventory is constructed from the TCEQ's data base of permitted point sources, and supplemented with knowledge of industrial sources in the area, now aided with modern satellite imagery and mapping techniques. To account for background levels from mobile and area sources, monitored values are added to the modeled results for the purpose of predicting compliance with the NAAQS. The monitored values are high values that include the impact of all sources, including point sources that are accounted for by the modeling. The resulting total concentrations are therefore unrealistically higher than best estimates of future

maximum concentrations in the area, but nonetheless reliably predict compliance with the NAAQS. The following table summarizes the results of the analysis; further information is available in the applicant's modeling report.

Total Concentrations for PSD NAAQS (Concentrations > De Minimis)					
Pollutant	Averaging Time	GLCmax (☞g/m^3)	Background (☞g/m^3)	Total Conc. = [Background + GLCmax] (☞g/m^3)	Standard (☞g/m^3)
NO_2	Annual	20	35	55	100
PM_{10}	24-hr	84	55	139	150
	Annual	8	27	35	50
SO_2	3-hr	750	115	865	1300
	24-hr	192	16	208	365
	Annual	60	4	64	80

The modeling results above indicate that the predicted concentrations from the LBEC and off-property sources will not result in an exceedance of the NAAQS for NO_2, PM_{10}, $PM_{2.5}$, or SO_2. The emissions from the proposed LBEC will not cause or contribute to concentrations above the NAAQS for these pollutants.

An ozone analysis was performed by the applicant following the current TCEQ guidance. A background concentration for O_3 was obtained from the EPA AIRS monitor 48-409-0659 located 527 Ransom Road, Aransas Pass, San Patricio County. A 3-year average, years 2006-2008, of the annual-fourth-highest, daily maximum, 8-hour concentrations was used in the analysis. The applicant evaluated the O_3 monitors near the Las Brisas Energy Center site and chose the monitor with the highest 3-yr average. The use of this monitor for a background concentration of ozone is reasonable. The monitoring data is summarized in the following table.

PSD Ambient Air Quality Analysis for Ozone				
Pollutant	Monitor	Averaging Time	Background ppb	Standard ppb

PSD Ambient Air Quality Analysis for Ozone				
Pollutant	Monitor	Averaging Time	Background ppb	Standard ppb
Ozone	48-409-0659	8-hr	74.7	75

The ozone analysis conducted by the applicant shows that the LBEC project alone is ozone-neutral. Based on historical analyses using the EKMA model, ozone-neutral sources would not be expected to have a discernible impact on the maximum ozone concentration in an area.

Although the proposed allowable emissions of lead from the LBEC are not subject to PSD, modeling for the state air permit indicates that the maximum impact are de minimis, as summarized in the following table.

Modeling Results for Lead: Minor NSR NAAQS AOI			
Pollutant	Averaging Time	GLCmax (☞g/m^3)	De Minimis (☞g/m^3)
Pb	3-mo.	8 x 10^{-5}	0.01

The quarterly maximum predicted lead concentration was derived by multiplying the annual predicted concentration by 4. Because the project's impacts for lead are de minimis, they don't threaten the NAAQS for lead.

On the basis of the preceding modeling analysis, the LBEC will not result in a violation of any NAAQs.

VIII. PSD INCREMENT ANALYSIS

Increment is consumed by the proposed LBEC, but when combined with other increment-consuming sources in the area, the increment consumption remains below allowable levels. The maximum increment consumption is summarized in the following table and further

information is available in the applicant's modeling report.

Table 7. Modeling Results for PSD Increment			
Pollutant	Averaging Time	GLCmax (☞g/m^3)	Increment (☞g/m^3)
SO_2	3-hr	236	512
	24-hr	78	91
	Annual	9	20
PM_{10}	24-hr	29.7	30
	Annual	4	17
NO_2	Annual	7	25

On the basis of this analysis, the LBEC will not result in a violation of any PSD increment.

IX. PSD AIR QUALITY MONITORING

The PSD rules require gathering of ambient monitoring data which is representative of air quality in the area before the proposed source begins operation. If predicted impacts from the source or other increment-consuming sources in the area are below monitoring exemption levels, monitoring is not required. The table below shows that although the NO_X impacts of the LBEC are below the level requiring gathering of ambient monitoring data, the impacts for SO_2 and PM_{10} are above the monitoring significance levels, and that ambient monitoring data is needed for these pollutants.

Modeling Results for PSD Monitoring Significance			
Pollutant	Averaging Time	GLCmax (☞g/m^3)	Significance (☞g/m^3)
NO_2	Annual	5	14
PM_{10}	24-hr	21	10

Modeling Results for PSD Monitoring Significance			
Pollutant	Averaging Time	GLCmax (☞g/m^3)	Significance (☞g/m^3)
SO_2	24-hr	37	13

The applicant evaluated ambient PM_{10} and SO_2 monitoring data to satisfy the PSD pre-construction monitoring requirements. In this case, local monitors in Corpus Christi provided representative information regarding existing ambient concentrations.

A background concentration for 24-hr PM_{10} was obtained from the EPA AIRS monitor 48-355-0034 located at 5707 Up River Rd., Corpus Christi, Nueces County. The highest third-high 24-hr value from 2007 was 55 ☞g/m^3. The highest second-high value was omitted since it occurred during an Eastern Texas Saharan Dust event.

A background concentration for 24-hr SO_2 was obtained from the EPA AIRS monitor 48-355-0032 located at 3810 Huisache Street, Corpus Christi, Nueces County. The highest second-high 24-hr value from 2007 was 16 ☞g/m^3.

The monitors are located within 5 km of the Las Brisas site, and are representative of the air quality in the area. Since representative monitoring data are available and are below the NAAQS for PM_{10} and SO_2, pre-construction monitoring at the site is not required.

X. PSD ADDITIONAL IMPACTS ANALYSIS

Additional air quality impacts from the construction phase of the project are expected to be minimal. Construction will take place over approximately 42 months, during which time a temporary workforce of up to 1,300 will be utilized. Between 70 to 85 permanent employees are expected to be required to operate the LBEC. Based on figures for 2007 from the Texas Workforce Commission, the Nueces County workforce was 157,400 and nearby San Patricio County about 23,600. Therefore, the peak temporary workforce will represent about 0.7% and the permanent workforce will represent about 0.05% of the available workforce in the two-counties, respectively. The area clearly has the workforce to fill many of the jobs, and infrastructure to accommodate needed imported workers. The plant will be operated to provide electricity to meet existing and future anticipated demand in the electric distribution region that would still exist in the absence of the project. Based on these factors, the project will not generate much growth in Nueces County or surrounding areas, or cause any significant shifts in population. Therefore, no significant increase in air contaminant emissions from secondary sources is anticipated as a result of the project. The direct ambient

air impacts will not significantly deteriorate the air quality of the area as demonstrated by the air dispersion modeling for the PSD increments and the NAAQS. Because the NAAQS are established by EPA for the protection of public health and welfare, including protection of soils and vegetation, no adverse impacts on plants or soils as a result of the project are predicted. The nearest Class I area, the Big Bend National Park, is approximately 480 km away from the site. Because it is more than 100 km away, a Class I area visibility impairment analysis is not required.

XI. AIR TOXICS AND STATE REGULATIONS REVIEW (NON-PSD)

A modeling evaluation of the proposed LBEC was made to demonstrate that the state property line regulations for SO_2 and H_2SO_4 in Title 30, Texas Administrative Code Chapter 112 would not be exceeded. The following table summarizes the regulatory standards and results.

Site-wide Modeling Results for TCEQ Property Line Standards			
Pollutant	Averaging Time	GLCmax (☞g/m^3)	Standard (☞g/m^3)
SO_2	1-hr	266	1,021
H_2SO_4	1-hr	26	50
	24-hr	5	15

Emissions will comply with the state property line regulations in 30 TAC Chapter 112.

A state effects evaluation was performed for non-criteria pollutants to demonstrate that the public health and welfare are protected. The AERMOD v. 07026 was used to predict the maximum ground-level concentrations of non-criteria pollutants expected to be emitted from the site. Except for the gaseous ammonia, HCl, and HF, these non-criteria pollutants are a subset of PM emissions. Predicted concentrations were compared to TCEQ-developed Effects Screening Levels (ESLs) and the guidance contained in TCEQ document RG-324 was performed for vanadium to demonstrate that the public health and welfare are protected. The following table is a summary of predicted maximum concentrations for metals, NH_3, HCl, HF, arsenic, boron, selenium, and silica:

Site-wide Modeling Results for Health Effects				
Pollutant & CAS#	Averaging Time	GLCmax (☞g/m^3)	GLCni (☞g/m^3)	ESL (☞g/m^3)

Site-wide Modeling Results for Health Effects				
Pollutant & CAS#	Averaging Time	GLCmax (☞g/m^3)	GLCni (☞g/m^3)	ESL (☞g/m^3)
Ammonia 7664-41-7	1-hr	21	< 21	170
Aluminum, Metal and Oxide 7429-90-5	1-hr	0.01	< 0.01	50
Arsenic & Inorganic Compounds 7440-38-2	1-hr	0.002	< 0.002	0.1
Beryllium, Particulate 7440-41-7	1-hr	0.0004	< 0.0004	0.02
Cadmium and Compounds Not Found	1-hr	0.001	< 0.001	0.1
Calcium Oxide 1305-78-8	1-hr	0.005	< 0.005	20
Hydrogen Chloride 7647-01-0	1-hr	21	< 21	75
Chromium (II) & (III) Compounds Not Found	1-hr	0.02	< 0.02	1
Copper Oxide (cuprous oxide; CuO) 1317-38-0	1-hr	0.001	< 0.001	10
Hydrogen Fluoride 7664-39-3	1-hr	2	< 2	5
Iron (As Iron Oxide) 7439-89-6	1-hr	0.06	< 0.06	50

Site-wide Modeling Results for Health Effects				
Pollutant & CAS#	Averaging Time	GLCmax (☞g/m^3)	GLCni (☞g/m^3)	ESL (☞g/m^3)
Magnesium Oxide (fume), respirable 1309-48-4	1-hr	0.002	< 0.002	50
Manganese Oxide 1344-43-0	1-hr	0.2	< 0.2	2
Mercury, Metal & Inorganic Forms Not Found	1-hr	0.001	< 0.001	0.25
Nickel, Metal & Compounds 7440-02-0	1-hr	0.148	0.127	0.15
Potassium Oxide (as K) Not Found	1-hr	0.007	< 0.007	50
Selenium & Compounds 7782-49-2	1-hr	0.07	< 0.07	2
Silica-amorphous+ crystalline Not Found	1-hr	2	< 2	10
Sodium Oxide 12401-86-4	1-hr	0.02	< 0.02	20
Titanium 7440-32-6	1-hr	0.0002	< 0.0002	50
Vanadium & Compounds (as Vanadium Pentoxide) Not Found	1-hr	0.7	0.6	0.5
	Annual	0.03	0.008	0.05

The results of the analysis indicate that the predicted worst-case concentrations for all

compounds are less than their respective 1-hr and annual average ESLs, except for vanadium & compounds. The predicted short-term maximum concentration off-property for vanadium & compounds is 1.4 times its ESL for 3 hours per year, and is 1.2 times its ESL for two hours per year at the highest non-industrial receptor. These impacts are considered acceptable by TCEQ's toxicologists.

XII. CASE-BY-CASE MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (MACT)

A. Petroleum Coke-Fired CFBs The proposed CFBs are major sources of hazardous air pollutants (HAP), a collection of about 189 pollutants listed by the EPA under the Federal Clean Air Act (FCAA) § 112(b). Under FCAA § 112, most major sources of HAP are subject to MACT standards for control of HAP. However, for some electric utility steam generating units (EUSGU), determining the applicability of regulation under § 112 is more complicated, based on language in FCAA § 112(n)(1) that requires EPA to perform a study of the hazards to public health associated with HAP emissions from EUSGU, and to require regulation of HAPS if the Administrator finds such regulation is appropriate and necessary after considering the results of the study. Following the 1999 study, the EPA published in December, 2000, a finding under FCAA § 112(c), called a "listing decision," that it was necessary and appropriate to regulate oil and coal-fired EUSGU under FCAA § 112. EPA later de-listed oil- and coal-fired EUSGU and developed regulations for mercury for the coal units and nickel for the oil units under FCAA § 111. These rules were vacated in March, 2008 by the U.S. Court of Appeals for the D.C. Circuit. Under this decision, the 2000 listing decision is thought to stand again. LBEC takes the position that the petroleum coke-fired CFBs are not subject to FCAA § 112 because petroleum coke is neither coal nor oil. LBEC cites the January 30, 2004 proposed MACT rule for coal and oil-fired EUSGUs, that refers to petroleum coke as a non-regulated supplementary fuel (69 Federal Register, page 4,674). Usually, if EPA fails to issue a MACT standard in a timely fashion, FCAA § 112(g) makes it necessary for new major HAP sources to undergo case-by-case MACT review under the NSR process. However, under the TCEQ's rule implementing FCAA § 112(g), at 30 TAC § 116.402(a), the requirements do not apply to EUSGU unless and until such time as these units are added to the source category list under FCAA 112(c)(5). Although the regulations do not seem to require case-by-case MACT analysis for the CFBs, LBEC provided a MACT-like analysis in Appendix D to the permit application, which concludes that if case-by-case MACT review were required, the results would be no more stringent requirements than proposed in the BACT determination.

B. Natural Gas-Fired Auxiliary Boilers and Propane-Fired Propane Vaporizers In June, 2007, the U.S. Court of Appeals for the D.C. Circuit vacated the National Emissions

Standard for Hazardous Air Pollutants [40 CFR 63, Subpart DDDDD(Boiler MACT)] that would have applied to the auxiliary boilers and propane vaporizers, which are classified as industrial boilers and process heaters for purposes of being a listed MACT category. Because of the vacatur, a FCAA § 112(g) case-by-case MACT permit review is required for these facilities. This section summarizes the results of that review.

The EPA definition of MACT for a new source in 40 CFR § 63.41 is:

"Maximum achievable control technology (MACT) emission limitation for new sources means the emission limitation which is not less stringent than the emission limitation achieved in practice by the best controlled similar source, and which reflects the maximum degree of reduction in emissions that the permitting authority, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable by the constructed or reconstructed major source."

The total HAPs emission from the auxiliary boilers and propane vaporizers may be estimated with emission factors from EPA publication AP-42, Tables 1.4-3, "Emission Factors for Speciated Organic Compounds from Natural Gas Combustion" and Table 1.4-4, "Emission Factors for Metals from Natural Gas Combustion." By summing the individual HAPs on these tables, a total organic HAP emission factor of 35% of the VOC emission factor, and a total non-mercury metal HAP emission factor of 0.070% of the total PM emission factor may be computed. The estimated combined HAP emissions from the auxiliary boilers and propane vaporizers is thus estimated to be 1 tpy of organic HAP, consisting primarily of benzene, formaldehyde, and hexane; and 0.002 tpy, or 5 pounds of non-mercury metallic HAP. Based on the emission factor for mercury, total annual emissions are estimated to be 115 grams of mercury.

The applicant considered entries in the EPA RBLC Clearinghouse for the purpose of identifying and evaluating available control options, emission limits, and averaging periods. The only add-on control identified in the RBLC Clearinghouse which could reduce HAP, was oxidation catalyst, found on two of the 16 gas-fired auxiliary boilers, and none of the 10 process heaters. Controls that were most identified included use of pipeline natural gas and adhering to good combustion practices.

Based on its review of other sources and beyond-the-floor analysis, LBEC is proposing no add-on controls to achieve MACT emissions limits for organic HAP because the cost of oxidation catalyst control devices are clearly not economically reasonable for such small and

limited use gas-fired combustion facilities. A standard design would not be available for a boiler or vaporizer in this size range, significantly increasing the total cost. Because the potential emission controlled is a fraction of one tpy of organic HAP per combustion unit, the cost would be prohibitive. LBEC is proposing no add-on controls to achieve MACT emissions limits for metallic HAP because particulate control devices are not applied to gas-fired boilers or process heaters. The metal HAPs are present in negligible quantities in the fuel, and the quantity and size of the particles do not lend themselves to effective removal.

The proposed controls to limit HAP emission from the auxiliary boilers and propane vaporizers are use of pipeline natural gas and commercial grade clean propane fuels, and adhering to good combustion practices. The proposed control technologies will meet the MACT emission limitations established pursuant to 30 TAC § 116.404 and meet the definition of MACT set forth in 30 TAC § 116.15(7).

In evaluating the appropriate emission limits for case-by-case MACT analyses, the requirement of 40 CFR § 63.43(d)(4), that case-by-case MACT determinations must take into consideration emissions standards that may have been proposed by EPA pursuant to § 112(d) of the Clean Air Act for the pertinent source category is relevant. LBEC considered the emissions standards under the relevant proposed, promulgated, and later vacated Boiler MACT. Under the Boiler MACT, CO emissions were used as a surrogate for organic HAP. Although the Boiler MACT has been vacated, CO remains an appropriate surrogate for organic HAPs. Irrespective of the Boiler MACT vacatur, it has been established in precedent that CO is a surrogate for organic HAPs. The Boiler MACT sets a CO limit of 400 ppmvd at 3% O_2 (0.30 lb CO/MMBtu) as MACT, which is higher than TCEQ BACT for new gas-fired combustion units. Therefore, a review of the "best controlled similar source" for CO emissions should be performed to establish the MACT floor for organic HAP emissions from the proposed auxiliary boiler. LBEC proposes a CO emission limit of 50 ppmvd (equivalent to a performance standard of 0.037 lb CO/MMBtu) for the auxiliary boilers and a limit of 100 ppmvd (0.074 lb/MMBtu) for the propane vaporizers as the appropriate MACT limits for organic HAP. These limits are consistent with the RBLC analysis. For metallic HAP, LBEC proposes a PM emission limit of 0.0076 lb/MMBtu total particulate, which is equivalent to EPA's AP-42 emission factor for natural gas firing, and is the sum of 0.0019 lb filterable PM/MMBtu and 0.0057 lb/MMBtu condensable PM/MMBtu. None of the entries in the RBLC identified metallic HAP limits. The proposal to set the limit based on AP-42 for total PM is consistent with the Boiler MACT, which places no limits on the emissions of PM as a surrogate for non-mercury metal HAP. In addition, the limit is consistent with the entries for PM in the RBLC, which for the boilers, appear to be based on AP-42.
As part of the analysis, LBEC reviewed the available literature to identify whether a "beyond-the-floor" MACT emission limit would be appropriate. For low-capacity-factor gas-fired auxiliary boilers, the lowest CO limit reported was a BACT level of 0.04 lb/MMBtu, or approximately 50 ppmvd, at 3% O_2, 3-hour average. For process heaters

less than 20 MMBtu/hr, a CO emission limit of 0.08 lb/MMBtu was the lowest reported limit. For emissions of metal HAPs, there were no limits below AP-42 and no better level of control than what is established at the MACT floor. The use of good combustion practices and clean gaseous fuels is the most effective among all identified particulate matter emission control strategies, irrespective of cost, and is consistent with the planned air pollution control technologies for the auxiliary boilers and propane vaporizers.

Planned startup and shutdown emissions were addressed in the permit for the auxiliary boilers and propane vaporizers. Maintenance activities were not addressed by the applicant and are not part of this permit. They will be addressed in a future permit action.

The TCEQ Executive Director has made a preliminary determination to issue Permit No. HAP48 to LBEC for the HAP pollutants subject to case-by-case permit review to be emitted from the Las Brisas Energy Center.

XIII. PLANT-WIDE APPLICABILITY LIMITS (PAL)

A PAL permit is a recent EPA innovation that simplifies the federal permit responsibilities for the source owner for a period of up to ten years. PALs apply to specific federally-regulated pollutants at the source owner's choosing. The PAL is a federal permit and does not affect a source's obligations under the state-law based permit review requirements. With a new source PAL for all federally regulated NSR pollutants, such as proposed by LBEC, the source may construct new facilities and make modifications over the ten-year life of the PAL, without having to undergo PSD review, as long as the source's actual emissions remain below it's allowable emissions, and no new emission reduction programs are developed which would otherwise require the source's emissions to be reduced. The requirements of the proposed PAL are contained in Special Condition No. 41 of the air permit. The PAL is also subject to the TCEQ rules implementing the federal PAL at 30 TAC 116, Subchapter C, relating to Plant-wide Applicability Limits. The TCEQ Executive Director has made a preliminary determination to issue PAL Permit No. PAL41 to LBEC for the federally-regulated NSR pollutants to be emitted from the Las Brisas Energy Center.

XIV. CONCLUSION

LBEC has proposed controls that represent BACT and MACT for the proposed emissions. Modeling analysis indicates that the proposed project will not violate the NAAQS or have any adverse impacts on the public health, soils, vegetation, or Class I Areas. Therefore, the

TCEQ Executive Director has made the preliminary determination to issue the air permits to LBEC as proposed to construct and operate the Las Brisas Energy Center, in Corpus Christi, Nueces County, Texas.