

US EPA ARCHIVE DOCUMENT

Section 2

Project Overview

Lon C. Hill, LP (LCH) is proposing to construct, own and operate a new 2x1 combined cycle power plant west of Corpus Christi, Nueces County, TX, which will be referred to as the Lon C. Hill Power Station. The new plant nominal capacity will be of approximately 625 to 740 megawatts (MW). Construction of the new plant is proposed to begin in May 2015 with commercial operation proposed for April 2017.

The site previously hosted a four unit generation facility that ceased operations in 2002 and was subsequently demolished down to the equipment foundations. All associated air permits (New Source Review Permits and Federal Operating Permits) were voided.

The proposed new facility will consist of two natural gas-fired combustion turbines (GTs), two heat recovery steam generators (HRSGs) with natural gas-fired duct burners and one steam turbine (ST) generator (2x1 configuration). Proposed ancillary equipment may include a natural gas fuel supply system, a water-cooled condenser with a cooling tower, an oil/water separator, two diesel storage tanks, an aqueous ammonia storage tank, and storage and dispensing of gasoline from a small gasoline storage tank. Other equipment may include an evaporative cooling system or gas turbine inlet chilling with the associated cooling tower and chilled water storage. Other ancillary equipment to be included in the final design include an auxiliary natural gas fired boiler, a diesel fired emergency generator, a fire protection system, and a degreaser. This equipment will be authorized under appropriate Air Quality Standard Permits or Permits by Rule (PBR)¹ upon final vendor selection.

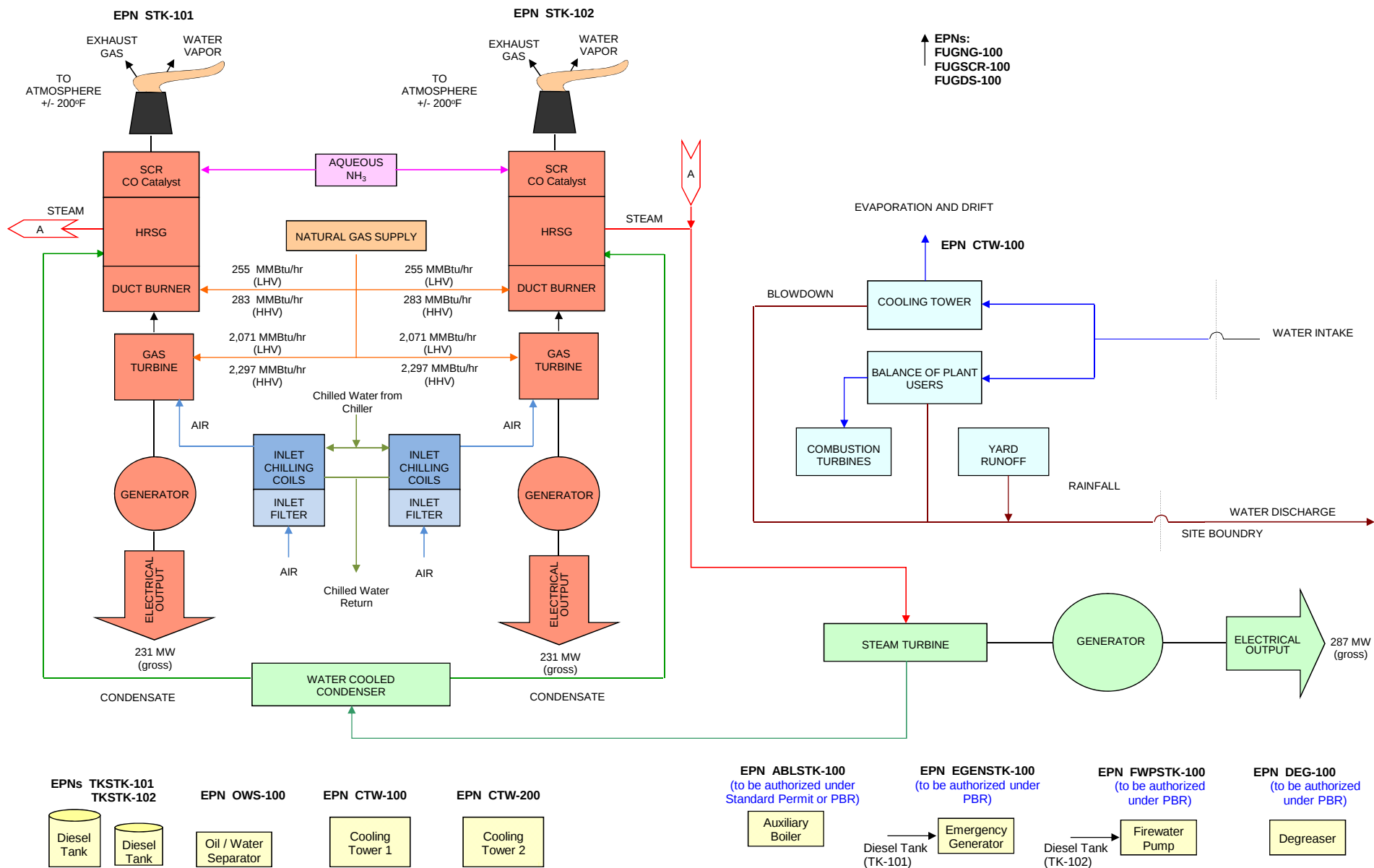
The combined cycle units will exclusively fire natural gas. Dry low-NOx (DLN) combustors will be used to reduce the nitrogen oxides (NOx) emissions at the turbine exhaust. The duct burners in the HRSGs will be equipped with low-NOx burners. Stack exhaust NOx emissions will be reduced to 2 parts per million volume dry basis corrected to 15 percent oxygen (ppmvdc) on a 24-hour average basis, using selective catalytic reduction (SCR) with aqueous ammonia (NH₃). NH₃ emissions will be limited to 7 ppmvdc. Stack exhaust carbon monoxide (CO) emissions will be reduced to 2 ppmvdc using CO catalyst.

The combined cycle emission rates represented on Table 1(a) are based on the expected maximum short-term and annual average emission rates. Due to the variability in potential operating conditions for the GTs (e.g., ambient temperature, load, etc.) and the unpredictable future demand for electric power, all of the potential operating cases cannot be represented in this permit application. Therefore, LCH requests that the operation of the turbines not be limited to the specific operating scenarios represented in this application, but instead, by the maximum emission rates represented in the Table 1(a).

¹ The planned auxiliary boiler may be authorized using Air Quality Standard Permit for Boilers or PBR §106.183. The emergency generator and fire water pump diesel engines may be authorized under PBR §106.512, and the degreaser under PBR §106.454.

LON C HILL REDEVELOPMENT PROJECT
LON C. HILL, LP

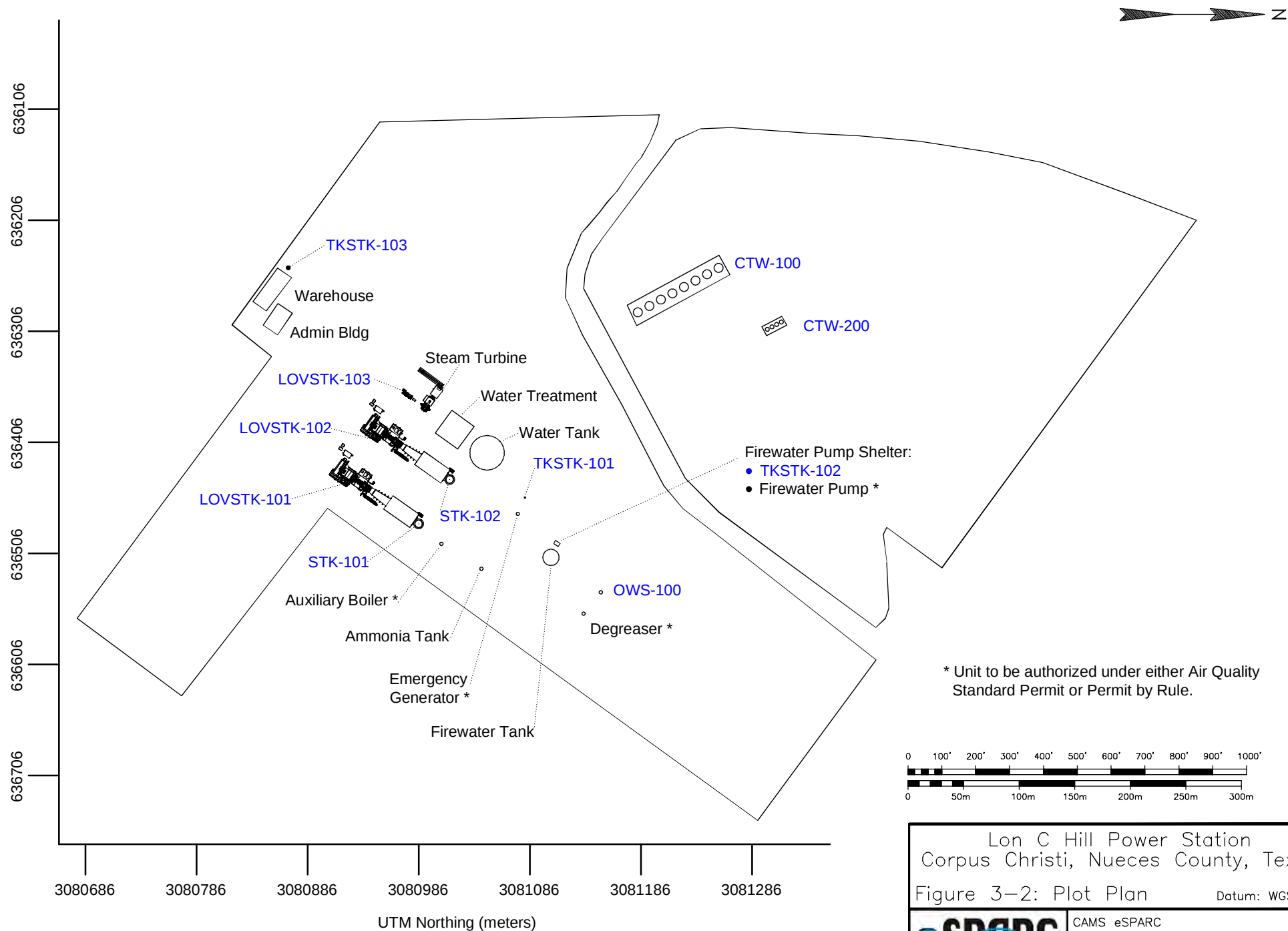
PROCESS FLOW DIAGRAM





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

III. Type of Permit Action Requested (continued)	
H. Federal Operating Permit Requirements (30 TAC Chapter 122 Applicability) (continued)	
2. Identify the type(s) of FOP(s) issued and/or FOP application(s) submitted/pending for the site. (check all that apply)	
☐ GOP Issued	☐ GOP application/revision application submitted or under APD review
☐ SOP Issued	☒ SOP application/revision application submitted or under APD review <i>Abbreviated application will be submitted concurrently</i>
IV. Public Notice Applicability	
A. Is this a new permit application or a change of location application?	☒ YES ☐ NO
B. Is this application for a concrete batch plant? If Yes, complete V.C.1 – V.C.2.	☐ YES ☒ NO
C. Is this an application for a major modification of a PSD, nonattainment, FCAA 112(g) permit, or exceedance of a PAL permit?	☐ YES ☒ NO
D. Is this application for a PSD or major modification of a PSD located within 100 kilometers or less of an affected state or Class I Area?	☐ YES ☒ NO
If Yes, list the affected state(s) and/or Class I Area(s).	
List:	
E. Is this a state permit amendment application? NO If Yes, complete IV.E.1. – IV.E.3.	
1. Is there any change in character of emissions in this application?	☐ YES ☐ NO
2. Is there a new air contaminant in this application?	☐ YES ☐ NO
3. Do the facilities handle, load, unload, dry, manufacture, or process grain, seed, legumes, or vegetables fibers (agricultural facilities)?	☐ YES ☐ NO
F. List the total annual emission increases associated with the application (List all that apply and attach additional sheets as needed):	
Volatile Organic Compounds (VOC): 143.8 tpy	
Sulfur Dioxide (SO ₂): 11.7 tpy	
Carbon Monoxide (CO): 846.4 tpy	
Nitrogen Oxides (NO _x): 208.7 tpy	
Particulate Matter (PM): (refer to PM ₁₀ and PM _{2.5})	
PM 10 microns or less (PM ₁₀): 112.1 tpy	
PM 2.5 microns or less (PM _{2.5}): 109.5 tpy	
Lead (Pb): N/A	
Hazardous Air Pollutants (HAPs): Total Individual HAP: 5.1 tpy. Total Combined HAPs: 16.5 tpy	
Other speciated air contaminants not listed above: H ₂ SO ₄ : 1.4 tpy. NH ₃ : 199.7 tpy	



Lon C Hill Power Station
Corpus Christi, Nueces County, Texas

Figure 3-2: Plot Plan

Datum: WGS 84

3.2 Process Description

Lon C. Hill Power Station will be a 2x1 combined cycle power plant consisting of two natural gas-fired combustion turbines (GTs), two heat recovery steam generators (HRSGs) with natural gas-fired duct burners (DBs) and a steam turbine (ST) generator. The plant nominal operating capacity will be approximately 625 to 740 megawatts (MW).

A process flow diagram illustrating the general plant configuration is included in Section 3.1. The material balance is provided in TCEQ Table 2, Section 3.4.

Gas Combustion Turbines (GTs)

The main function of each GT is to produce shaft power to generate electricity. In each GT, large volumes of air are compressed to high pressures. The compressed air is subsequently injected, together with the combustion fuel, into the GT combustion chamber. The fuel for the units will be natural gas only. Hot gases from the combustion chamber turn the turbine that drives the compressor and the GT generator producing electricity, before exhausting to the HRSG for steam production. Each HRSG contains a gas-fired duct burner assembly that supplements the steam production. The steam from the two HRSGs is then passed through a single steam turbine to generate additional electricity.

Each GT will be equipped with an inlet air filtration system and either an inlet chilling system or an evaporative cooling system, to pre-treat the combustion air. The inlet air filtration system removes the bulk of the particulate matter in the inlet air. The filtration improves both long-term compressor efficiency and compressor blade life, by reducing erosion and fouling of the GTs inlet air compressors. The inlet chilling, as well as the evaporative cooling, if installed, cools the inlet air to within a few degrees of the prevailing wet bulb temperature; this increases the output of the GTs and improves efficiency. Emission estimates for scenarios with and without cooling of the inlet air are provided in this application (Attachment B).

NO_x emissions from the GTs will be controlled with DLN combustors in combination with a SCR. One aqueous ammonia tank will be installed as part of the project to supply ammonia to the SCR systems for both units. CO emissions from the GTs will be controlled with CO-oxidation catalysts.

The proposed new combined cycle facility will utilize either Siemens SCC6-5000F GTs with duct-fired HRSGs and a single SST6-5000 steam turbine or General Electric 7FA.04/7FA.05 GTs with duct-fired HRSGs and a single D-11 steam turbine. Each GT will have an estimated nominal gross output of approximately 195 to 240 MW. The ST is expected to generate approximately 230 to 290 MW.

Heat Recovery Steam Generators (HRSGs)

The HRSGs use the hot combustion gases exiting the GTs to produce steam. Indirect heating of the HRSG feed water produces steam at various pressure levels. Each HRSG is supplied with supplementary firing (duct burners) to increase the steam production as required to generate more power. The HRSG duct burners will be fired with natural gas only. The maximum firing rate of each duct burner system

will be approximately 250 to 670 MMBtu/hr (HHV). The CO-oxidation catalyst and the SCR technology will be installed between the tube banks within the HRSGs.

Lube Oil Vents

The combustion turbines and the steam turbine require lube oil reservoirs that can potentially emit small amounts of particulate matter through atmospheric vents. The lube oil vents will be equipped with mist eliminators with 99.9% efficiency. Consequently, associated particulate matter emissions are estimated to be below 0.1 pounds per hour (lb/hr) per vent.

Auxiliary Boiler

The design of the new facility may include a natural gas fired auxiliary boiler to provide pre-warming steam to the steam turbine generator prior to startup. Use of the auxiliary boiler will decrease the amount of time that the combustion turbines must be run at low output levels during startup, particularly during cold startups. After the final design is completed, the auxiliary boiler will be appropriately authorized with an Air Quality Standard Permit or PBR §106.183.

Emergency Generator

The design of the new facility contemplates the installation of a diesel engine driven emergency generator, to provide power to essential ancillary equipment in the event of a loss of primary power. This equipment will be authorized with PBR §106.512.

Firewater Pump

The design of the new facility currently includes the installation of a diesel engine driven firewater pump. Procurement for this equipment has not yet been completed. Upon vendor selection, LCH will authorize the unit under PBR §106.512.

Cooling Water System

LCH intends to utilize a cooling tower with a water-cooled condenser in order to minimize the station water demand. The preliminary cooling tower design considers the use of gray water from the City of Corpus Christi for cooling tower make up. Gray water may undergo filtration as needed. A portion of the cooling water circulation (blowdown) will be purged from the system to prevent concentrations of solids or other constituents in the circulating water from building up to unacceptable levels. The cooling water drift factor rate will not exceed 0.001%.

LCH is also evaluating the possibility of enhancing the performance of the combustion turbines by incorporating either evaporative coolers or inlet chillers. The Inlet chiller option will have an associated cooling tower and chilled water storage. The cooling tower drift factor rate will not exceed 0.0005%.

Oil/Water Separator

The site will be equipped with an oil/water separator to treat oil impacted water effluents. The oil/water separator could potentially emit small amounts of volatile organic compounds to the atmosphere. The preliminary design includes a 96,000 gallon per year unit.

Degreaser

A degreaser unit may also be required at the site. The degreaser could potentially emit small amounts of volatile organic compounds to the atmosphere. Procurement of this equipment has not yet been completed. LCH will authorize the unit under PBR §106.454.

Storage Tanks

There will be two diesel storage tanks to supply diesel fuel to the ancillary equipment. The preliminary design includes a larger 700 gallon tank and a smaller 300 gallon tank.

In addition, there will be an aqueous ammonia storage tank for use in the SCR systems. The aqueous ammonia tank will be pressurized and therefore will have no emissions to the atmosphere. The preliminary design includes a 25,000 gallon tank to serve both combined cycle units.

The new plant may also include a 250-gallon tank for gasoline storage. This fuel will be used in miscellaneous plant equipment. It is expected that no more than 250 gallons of gasoline will be used annually.

3.3 Maintenance, Startup and Shutdown

This permit application proposes to authorize planned or routine maintenance, startup and shutdown (MSS) and temporary maintenance facilities associated with the Lon C. Hill Power Station. The number and/or duration of planned MSS activities are not to be construed as binding since permit compliance will be based upon proposed emission rates as represented on Table 1(a). MSS emission rate calculations are described in Section 4.2. MSS proposed activities include:

- Gas turbine startup and shutdown events;
- Maintenance natural gas purging;
- Offline turbine washing;
- Coalescer filter change out.

Authorization for other MSS activities including but not limited to soldering, brazing and welding, abrasive blasting, sitewide painting, etc., will be completed under PBR §106.263 when final design is complete. Other inherently low-emitting (ILE) planned maintenance activities, including but not limited to CEM calibration, analytical equipment and process instruments maintenance, etc., will also be authorized under §106.263.

3.4 Table 2 Material Balance

Table 2 Material Balance for the Lon C. Hill Power Station is provided in Attachment A.

3.5 TCEQ Equipment Tables

TCEQ equipment tables are provided in Attachment A of this application, as follows:

Table 1 – TCEQ Equipment Tables

TCEQ Equipment Table	Units (FIN)
Table 31 – Combustion Turbines	Unit 1 Gas Turbines (CC-101) Unit 2 Gas Turbines. (CC-102)
Table 6 – Boilers and Heaters	Unit 1 HRSG Duct Burners (CC-101) Unit 2 HRSG Duct Burners (CC-102)
Table 7(a) – Vertical Fixed Roof Storage Tank Summary	Diesel Tank (TK-101) Diesel Tank (TK-102) Gasoline Tank (TK-103)
Table 7(b) – Horizontal Fixed Roof Storage Tank Summary	Aqueous Ammonia Tank (TK-103)

Section 4

Emission Data and Calculations

This section describes the methods used to estimate the emission rates associated with the air permit application. The emission sources are listed in Table 2. Emission rate estimates are provided for routine and MSS operations. A complete Table 1(a) is included in Attachment A. Refer to Attachment B for detailed calculations.

4.1 EPN-FIN Cross Reference Table

Table 2 – EPN-FIN Cross Reference

EPN	FIN	Description
STK-101	CC-101	Unit 1 Combined Cycle (GT+HRSG DB)
STK-102	CC-102	Unit 2 Combined Cycle (GT+HRSG DB)
LOVSTK-101	CC-101	Unit 1 GT Lube Oil Vent
LOVSTK-102	CC-102	Unit 2 GT Lube Oil Vent
LOVSTK-103	ST-103	ST Lube Oil Vent
CTW-100	CTW-100	Cooling Tower 1
CTW-200	CTW-200	Cooling Tower 2
OWS-100	OWS-100	Oil Water Separator
TKSTK-101	TK-101	Diesel Tank (Emergency Generator)
TKSTK-102	TK-102	Diesel Tank (Firewater Pump)
TKSTK-103	TK-103	Gasoline Tank
FUGNG-100	FUGNG-100	Fugitive Natural Gas Service
FUGSCR-100	FUGSCR-100	Fugitive Ammonia Service
FUGDS-100	FUGDS-100	Fugitive Diesel Service
PURG-100	PURG-100	MSS Fuel Purging Emissions
OFFWASH-100	CC-101 and CC-102	MSS Offline Turbine Washing

4.2 Emitting Sources

Combined Cycle Units (FINs: CC-101 and CC-102; EPNs: STK-101 and STK-102)

Two combined cycle gas turbine generators nominally rated at approximately 195 to 240 MW of power (gross) and two HRSGs equipped with supplemental duct burner firing are proposed. The maximum firing rate of the HRSG duct burners is of approximately 250 to 670 MMBtu/hr (HHV) for each train. The GTs and HRSG duct burners will be fired with natural gas only.

Combustion emissions associated with the GTs and the HRSG duct burners include NO_x, CO, VOC, SO₂, PM₁₀/PM_{2.5}, sulfuric acid (H₂SO₄), and hazardous air pollutants (HAPs). There may also be ammonia slip from the SCR systems. Emission rate estimates for the GT/HRSG train stacks are based on vendor estimated data, fuel analysis data, and regulatory requirements. The natural gas heating value was calculated based on the natural gas analysis, as provided by turbine vendor data, as 926 Btu/scf (LHV) and 1,027 Btu/scf (HHV).

Since pollutant emission rates may vary depending on ambient conditions, several operating scenarios representing a range of ambient temperatures were considered for estimating the maximum hourly emission rates. Table 3 shows the various operating scenarios considered.

Table 3 – GT/HRSG Operating Scenarios – Hourly Emission Rate Calculations

GT	Scenario	Ambient Temperature (°F)	Load %	GT Rate (MMBtu/hr, HHV)		HRSG Duct Burner (MMBtu/hr, HHV)
				Inlet Cooling OFF	Inlet Cooling ON	
Siemens SCC6-5000F	1	15	Base	2,260	--	283
	2	45	Base	2,262	--	270
	3	60	Base	2,277	--	255
	4	75	Base	2,274	2,297	233
	5	95	Base	2,124	2,217	160
GE S207FA.04	1	13	Base	1,918	--	329 (97% DB)
	2	60	Base	1,807	1,829	34 (10% DB)

Inlet Cooling may be achieved through evaporative coolers or inlet chillers.

Detailed emission rate calculations are provided in Attachment B of this application. For each pollutant, the total emission rate out the stack considers the combined flow from the GT exhaust and the duct burner exhaust, controlled by the CO-catalyst and the SCR. The proposed hourly emission rate limit for each pollutant is based on the ambient conditions which result in the maximum hourly emission rate for the Siemens or GE evaluated equipment.

Annual emission rates were evaluated assuming continuous annual operation (8,760 hours per year per unit) as well as cases with maximum annual startups and shutdowns (8,188 hours per year of routine operation and 572 hours per year of startups and shutdowns), as shown in Table 4.

Table 4 – GT/HRSO Operating Scenarios – Annual Emission Rate Calculations

GT	Scenario	Ambient Temperature (°F)	Inlet Cooling	Duct Firing	Routine Hours of Operation	Startup Shutdown Hours of Operation
Siemens SCC6-5000F	1	45	OFF	ON	8,760 8,188	-- 572
	2	65	OFF	ON	8,760 8,188	-- 572
	3	75	ON	ON	8,760 8,188	-- 572
	4	*	OFF	ON	8,760 8,188	-- 572
GE S207FA.04	1	13	OFF	ON	8,760 8,188	-- 572
	2	60	ON	ON	8,760 8,188	-- 572

*45 °F ambient temperature from April through October (to simulate inlet cooling on) and 60 °F from November through March.

The proposed annual emission rate limit for each pollutant is based on the maximum of these scenarios (for either Siemens or GE alternatives), which collectively allow the operational flexibility necessary for the plant to respond to market demands. NO_x stack concentrations will be controlled by a SCR system and are established by the vendor to be at 2 ppmvdc on a 24-hour average basis. CO stack concentrations will be controlled by a CO-oxidation catalyst and are established by the vendor to be at 2 ppmvdc. SO₂ emission rates are based on an average annual fuel sulfur content of 0.2 grains per 100 standard cubic feet (scf). It is assumed that 8 percent of the SO₂ emissions from the turbine and the duct burners will oxidize to form SO₃. It is assumed that 95 percent of the SO₃ will form H₂SO₄. However, no reduction to the total SO₂ emission rate (hourly or annual) is accounted for, even though SO₂ oxidizes to form SO₃. The post-SCR, post-CO-oxidation catalyst maximum hourly and annual emission rates from the stack are represented in this application for each pollutant. Detailed calculations are provided in Attachment B.

GT Startup and Shutdown Events

The startup and shutdown emission rates for NO_x, CO, VOC and NH₃ are based on the projected amount of time needed for MSS activities and vendor-supplied data. MSS activities associated with the turbines are expected to occur for a maximum of 572 hours per year per turbine. The duration of the startups will be minimized to the best extent possible for each unit.

A startup is initiated when the Data Acquisition and Handling System (DAHS) detects a flame signal and ends when the permissive for the emission control system are met (i.e., steady state emissions compliance is achieved). The turbines will have the following typical startups:

- Cold Startup: is a startup after an extended GT shutdown of greater than 64 hours, with the ST HP/IP metal temperatures less than 485 °F (252 °C). It is expected to have no more than 10 events per year at approximately 241 minutes per event;
- Warm Startup: is a startup after a GT shutdown of 16 to 64 hours, with the ST HP/IP metal temperatures between 485 °F (252 °C) and 685 °F (363 °C). It is expected to have no more than 50 events per year at approximately 136 minutes per event;
- Hot Startup: is a startup after a GT shutdown of less than 16 hours, with the ST HP/IP metal temperatures greater than ~ 685 °F (363 °C). It is expected to have no more than 200 events per year at approximately 93 minutes per event; and

A startup is initiated when the Data Acquisition and Handling System (DAHS) detects a flame signal (or equivalent signal) and ends when the permissives for the emission control system are met (i.e., steady state emissions compliance is achieved).

A shutdown begins when the load drops to the point at which steady state emissions compliance can no longer be assured and ends when a flame-off signal is detected.

We have represented a conservative operating scenario that combines hot, warm, and cold startups to achieve the worst case (i.e., maximum emission rate expected from the new facility). This facility will likely be a merchant facility and cannot be operationally constrained to a specific number of hot, warm, or cold startups. Therefore, LCH requests that compliance be demonstrated by maintaining short and long term emission rates below those represented in the permit application, rather than a specific number of hot, warm, and/or cold startups.

The emission rates are based on vendor data. Detailed emission rate calculations and example calculations are provided in Attachment B

Lube Oil Vents (FINs: CC-101, CC-102 and ST-103; EPNs: LOVSTK-101, LOVSTK-102 and LOVSTK-103)

Lube oil vents from the gas turbines and the steam turbine could potentially emit particulate matter. Emission rates are calculated based on the demister oil flow rate and 99.9 percent mist eliminator efficiency. Detailed emission rate calculations and example calculations are provided in Attachment B

Cooling Towers (FINs: CTW-100 and CTW-200; EPNs: CTW-100 and CTW-200)

Wet cooling towers provide direct contact between the cooling water and the air passing through the tower. Some of the liquid water from the cooling tower may be entrained in the air stream and be carried out of the tower as “drift” droplets. Therefore, the particulate matter constituents of the drift droplets may be classified as a pollutant emission. A conservative assumption is that all of the solids in the cooling tower drift become PM₁₀/PM_{2.5}. According to the preliminary estimates, the CTW-100 water circulation flow rate will be 127,000 gallons per minute (gpm) and the drift rate will be 0.001%. For the

CTW-200 water circulation flow rate will be 10,000 gpm and the drift rate of 0.0005%. Detailed emission rate calculations and example calculations are provided in Attachment B.

Oil Water Separator (FIN: OWS-100; EPN: OWS-100)

VOC emissions from the oil water separator are expected to be minimal due to the low vapor pressure of the products that may be introduced to the separator (turbine oil and lube oils). Emission rates have conservatively been calculated using an emission factor of 5 pounds of VOC per 1,000 gallons of oil, according to US EPA AP-42 Chapter 5.1 "Petroleum Refining". The preliminary design includes a 96,000 gallon per year unit. Detailed emission rate calculations and example calculations are provided in Attachment B. The oil water separator will be cleaned on an interval of every five years or less. Due to the low vapor pressure of the products that may be introduced to the oil water separator and the short duration of the cleaning event, only negligible emissions are expected to occur during this infrequent, non-routine activity.

Diesel Tanks (FINs: TK-101 and TK-102; EPNs: TKSTK-101, TKSTK-102)

The plant may be equipped with two diesel tanks, a 700 gallon tank (TK-101) and a 300 gallon tank (TK-102). Emission rates are calculated using US EPA TANKS 4.09D software. Short-term emission rates are calculated based on TCEQ's "Technical Guidance Package for Storage Tanks, RG-166" (Draft, February 2001). Annual emission rates are calculated based on the potential auxiliary equipment fuel demand and the tanks' capacity. VOC is the only pollutant associated with the diesel tanks. Detailed emission rate calculations and example calculations are provided in Attachment B.

Gasoline Tank (FIN: TK-103; EPN: TKSTK-103)

The plant may be equipped with a 250 gallon gasoline storage tank. Emission rates are calculated using US EPA TANKS 4.09D software. Short-term emission rates are calculated based on TCEQ's "Technical Guidance Package for Storage Tanks, RG-166" (Draft, February 2001). Annual emission rates are calculated based on a maximum gasoline usage of 250 gallons per year. VOC is the only pollutant associated with the gasoline tank. Hazardous air pollutants, including benzene, toluene and xylenes emission rates are included in the calculations. Detailed emission rate calculations and example calculations are provided in Attachment B.

Fugitive Emissions (FINs: FUGNG-100, FUGSCR-100, FUGDS-100; EPNs: FUGNG-100, FUGSCR-100, FUGDS-100)

Fugitive releases of VOC may originate from the natural gas and diesel fuel lines, while NH₃ fugitive emissions could occur from the SCR ammonia handling system and piping, although extremely unlikely. Emission rates were estimated based in the preliminary design component counts. Emission factors used were obtained from TCEQ's "Technical Guidance for Chemical Sources – Equipment Leak Fugitives" (Draft, October 2000). No control efficiency is claimed for natural gas and diesel service components, while for ammonia service "AVO" is claimed. Audio, visual and olfactory walk-through inspections are applicable for inorganic/odorous and low vapor pressure compounds. Visual checkups will be

conducted every 4 hours. Detailed emission rate calculations and example calculations are provided in Attachment B.

Maintenance Fuel Gas Purging (FIN: PURG-100; EPN: PURG-100)

During startup, shutdown or protective tripping of the facility, fuel gas line purging occurs on an automated basis in both the gas turbine and the HRSG duct burner fuel supply lines. During such events, some natural gas will be released to the atmosphere as line pressure between double-block and bleed function shutoff valves is vented. Fuel purging emissions are based on the Universal Ideal Gas Law, with the assumption that in one hour, the entire length of pipe is purged once and the purging takes place for every startup, shutdown and protective tripping of the units. Detailed emission rate calculations and example calculations are provided in Attachment B.

Maintenance Offline Washing of Turbines (FIN: CC-101 and CC-102; EPN: OFFWASH-100)

Offline water washing can potentially release small VOC vapors associated with the soap-based cleaning solution. Emission rates are calculated using a mass balance approach and are based on the chemical soap throughput and VOC content. Offline wash of the turbines is performed up to four times a year (two washes per unit per year) and lasts for approximately one hour each time. Detailed emission rate calculations and example calculations are provided in Attachment B.

Filter Change-Outs

When a coalescer filter is replaced, the filter housing is opened to the atmosphere, possibly releasing very small quantities of vapors. However, emission rate calculations are not required due to the low vapor pressure of the turbine oil associated with the coalescer. According to a TCEQ Memo dated September 19, 1996 from Victoria Hsu, emission rate calculations are not required if the vapor pressure is below 0.0002 psia at 104°F.

4.3 Non-Emitting Sources

In addition to the emission sources describe in Section 4.2, the Lon C. Hill Power Station will be equipped with a 2.5 million gallon water storage tank, a 1 million gallon water tank for the firewater system, a 25,000 gallon pressurized aqueous ammonia tank, and various tanks and totes containing water treatment chemicals. None of these tanks constitutes a potential emission source. However, the aqueous ammonia equipment leak fugitives are quantified separately as described in the previous section.

4.4 Table 1(a) Emission Point Summary Table

Three complete Table 1(a)s are included in Attachment A, one with the worst case maximum emissions, a second one with combined cycle units using Siemens vendor data and a third one with GE vendor data.

5.1 Summary of BACT

Table 5 summarizes the control technologies proposed for the Lon C. Hill Power Station to meet BACT. The remainder of this section describes the individual BACT analyses for the new sources being constructed as part of this project.

Table 5 – Summary of BACT Control Methods for Lon C. Hill Power Station

Pollutant	Proposed BACT	Proposed Concentration Limit	Averaging Period
Combined Cycle Units			
NO _x	Dry low NO _x burners for the GTs. Low NO _x burners for the duct burners. SCR.	2 ppmvdc	24-hour average
CO	Natural gas only. Good combustion practices. Oxidation catalyst.	2 ppmvdc 2 ppmvdc	24-hour average Annual average
NH ₃	Proper operation of SCR.	7 ppmvdc	Hourly average
VOC	Natural gas only. Good combustion practices.	2 ppmvdc 2 ppmvdc	24-hour average Annual average
PM ₁₀ /PM _{2.5}	Natural gas only. Good combustion practices.		
SO ₂	Natural gas only. Good combustion practices.		
H ₂ SO ₄	Natural gas only. Good combustion practices.		
MSS	Limited to the emission rate estimates described in Section 0 and summarized in Attachment A, Table 1(a).		
Lube Oil Vents			
PM ₁₀ /PM _{2.5}	Emissions not to exceed 0.1 lb/hr per lube oil vent.		
Cooling Water Towers			
PM ₁₀ /PM _{2.5}	Use of drift eliminators	Drift Loss 0.0005% - 0.001% wt	
Oil Water Separator			
VOC	Use of low vapor pressure material.		
Storage Tanks			
VOC	Fixed roof. Submerged fill-pipes. Vapor pressure < 0.5 psia (diesel). Tank capacity < 700 gal.		

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Table 5– Summary of BACT Control Methods for Lon C. Hill Power Station (*continued*)

Pollutant	Proposed BACT	Proposed Concentration Limit	Averaging Period
Fugitive Emissions			
VOC	Low VOC content in the natural gas piping system. Low component count in the diesel piping system.		
NH ₃	Aqueous ammonia (19% NH ₃ content). 97% control efficiency for Audio, Visual and Olfactory (AVO) walk-through inspections conducted every four hours.		

5.2 BACT Analysis for the Combined Cycle Units

This section addresses BACT requirements for emissions of NO_x, CO, VOC, PM₁₀/PM_{2.5}, SO₂, H₂SO₄ and NH₃ from the GT/HRSO. Attachment C includes a summary of the latest RBLC database for natural gas fired combined cycle units.

5.2.1 NO_x

NO_x emissions from turbines and duct burners are the result of either the combination of elemental nitrogen and oxygen in air within the combustion device (thermal NO_x), or the oxidation of the nitrogen contained in the fuel (fuel NO_x). The natural gas fuel does not contain a significant amount of nitrogen; therefore, most of the NO_x emissions from the turbines and the duct burners are the result of thermal NO_x.

BACT Step 1 – Identify All Available Control Technologies

Table 6 summarizes, in order of increasing efficiency, the available control technologies listed for gas fired combined cycle units in the current RBLC database (refer to Attachment C).

Table 6 – Natural Gas Fired Combined Cycle NO_x Control Technologies

Control Technology	Description
Good Combustion Practices	Suppression of thermal NO _x formation in combustion sources is commercially demonstrated through the adjustment of the air-fuel ratio, combustion air temperature, and combustion zone cooling. Adjustments of these parameters may be accomplished through water injection or dry control technology.
Steam/Water Injection	To reduce combustion temperature, steam or water can be mixed with the air flow. This lowers combustion temperature to below 1,400°F, limiting thermal NO _x generation. However, this technique has the disadvantage of potentially increasing the concentration of CO and unburned hydrocarbons emitted from the turbine.
Low NO_x Burners	Low NO _x burners allow for a reduced oxygen level, in comparison to ambient air (approximately 10% versus 21%), resulting in peak flame temperatures less than 3,000 degrees Fahrenheit, and therefore reduce the generation of thermal NO _x .
Lean Pre-Mix, Dry Low NO_x (DLN)	DLN combustors and pre-mixing fuel and air, minimize flame temperature and therefore the generation of thermal NO _x .
XONON	This technology is designed to avoid the high temperatures created in conventional combustors. The XONON combustor operates below 2,700°F at full power generation, which significantly reduces NO _x emissions without raising, and possibly even lowering, emissions of CO and unburned hydrocarbons. XONON uses a proprietary flameless process in which fuel and air react on the surface of a catalyst in the turbine combustor to produce energy in the form of hot gases, which drive the turbine.
EMx (SCONox)	The EMx (SCONox) system is based on a multi-pollutant reducing platinum catalyst bed coated with potassium carbonate. The catalyst is designed to reduce NO _x , CO and VOC emissions and is situated downstream of the combustion chamber in a separate reactor vessel and operates in an ideal temperature window of 300 °F to 700 °F. The EMx system does not require a reactant. The SCONox catalyst is very susceptible to fouling by sulfur in the flue gas. These catalysts have high frequency maintenance requirements (recoating or washing must be done every 6 months to a year depending on the gas sulfur content).
Selective Catalytic Reduction (SCR)	Ammonia is injected from the SCR system into the turbine and DB exhaust gases upstream of a catalyst bed. On the catalyst surface, ammonia reacts with NO _x to form nitrogen and water. Optimal NO _x reduction occurs at catalyst bed temperatures between 575 and 750 degrees Fahrenheit for conventional (typically vanadium or titanium-based) catalyst types. The NO _x removal efficiency depends on the flue gas temperature, amount of catalyst, and the NH ₃ to NO _x ratio in the flue gas stream. According to the RBLC database, recent permits have been issued at NO _x emission rates as low as 2.0 ppmvdc, 24-hour average, using SCR technology on natural gas fired combined cycle turbines, with ammonia slip levels in the neighborhood of 7 ppmvdc.

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Table 6 -Natural Gas Fired Combined Cycle NO_x Control Technologies (*continued*)

Control Technology	Description
Selective Catalytic Reduction (SCR)	Ammonia is injected from the SCR system into the turbine and duct burner exhaust gases upstream of a catalyst bed. On the catalyst surface, ammonia reacts with NO _x to form nitrogen and water. Optimal NO _x reduction occurs at catalyst bed temperatures between 575 and 750 degrees Fahrenheit for conventional (typically vanadium or titanium-based) catalyst types. The NO _x removal efficiency depends on the flue gas temperature, amount of catalyst, and the NH ₃ to NO _x ratio in the flue gas stream. According to the RBLC database, recent permits have been issued at NO _x emission rates as low as 2.0 ppmvdc, 24-hour average, using SCR technology on natural gas fired combined cycle turbines, with ammonia slip levels in the neighborhood of 7 ppmvdc.

BACT Step 2 – Eliminate Technically Infeasible Options

The only options considered to be technically infeasible are XONON and EMx (SCONOX). These technologies are promising, but have limited commercial validation. The only installations have been on smaller power generation units (<85 MW each).

The only two sites found in the RBLC data base that use these technologies were: three 56 MW units at a facility employing XONON and two 83 MW units at a site employing EMx. These units are three to four time smaller than the proposed units. Both technologies claim a NO_x exhaust concentration of 2.5 ppmvdc. The scalability and reliability of these technologies remains to be proven. Therefore, due to the differences in the size and the lack of sufficient commercial applications, these options were deemed to be undemonstrated for the proposed facility and technically infeasible.

BACT Step 3 – Rank Remaining Control Technologies

Technically feasible technologies are therefore, in order of increasingly efficiency, good combustion practices, steam or water injection, low NO_x burners, DLN combustors and SCR. According to the data from RBLC database, the combination of good combustion practices and DLN combustors can achieve NO_x exhaust concentrations of 9 ppmvdc. The combination of low NO_x burners and SCR can achieve NO_x exhaust concentrations of 2 ppmvdc. The top level control is considered to be the combination of good combustion practices, use of pre-mix DLN combustion, use of low NO_x burners and SCR, shown to achieve NO_x exhaust concentrations of 2 ppmvdc.

BACT Step 4 – Evaluate Most Effective Control Technologies

The most effective control technology listed for units comparable to those at the proposed project is good combustion practices combined with the use of pre-mix DLN combustion, low NO_x burners, and

SCR catalyst. These technologies are commonly employed and consistently meet concentration limits in the range of 2 ppmvdc to 2.5ppmvdc. The technologies are robust and proven.

BACT Step 5 - Select the BACT

The Lon C. Hill combined cycle units will use SCR in combination with DLN combustors and low NOx burners to achieve a NOx emission rate of 2.0 ppmvdc for a 24-hour averaging period. These control technologies have been commonly applied as BACT in recent permitting activities [e.g., Avenal Energy Project (CA), Colusa Generation Station (CA), King Power Station (TX) and Thomas C. Ferguson Power Station (TX)]. For units of a size similar to the proposed Lon C. Hill units, the achieved NOx concentrations range from 2 ppmvdc to 2.5ppmvdc. This is consistent with both the published Texas BACT levels and the concentration proposed for this project of 2 ppmvdc , 24-hour rolling average.

5.2.2 CO

Carbon monoxide emissions from combustion turbines and duct burners are the result of incomplete fuel combustion. Operating conditions that may enhance CO formation include low temperature, insufficient residence time, and insufficient oxygen in the combustion zone. Insufficient oxygen may be the result of either a low air-to-fuel ratio or inadequate mixing, or both.

BACT Step 1 - Identify All Available Control Technologies

Table 7 summarizes, in order of increasing efficiency, the available control technologies listed for gas fired combined cycle units in the current RBLC database (refer to Attachment C).

Table 7 – Natural Gas Fired Combined Cycle CO Control Technologies

Control Technology	Description
Good Combustion Practices	Good combustion practices refer to design and operational practices that promote the complete combustion of fuel, leading to lower CO emissions, such as (1) efficient tuning of the air-to-fuel ratio in the combustion zone to allow minimal generation of unburned carbon; (2) proper combustor design that promotes air/fuel mixing and longer combustion chamber residence times, adequate temperature and turbulence; and (3) diligent maintenance and operation according to manufacturer's specifications.
EMx (SCONox)	The EMx (SCONox) system is based on a multi-pollutant reducing platinum catalyst bed coated with potassium carbonate. The catalyst is designed to reduce NOx, CO and VOC emissions and is situated downstream of the combustion chamber in a separate reactor vessel and operates in an ideal temperature window of 300 °F to 700 °F. The EMx system does not require a reactant. The SCONox catalyst is very susceptible to fouling by sulfur in the flue gas. These catalysts have high frequency maintenance requirements (recoating or washing must be done every 6 months to a year depending on the gas sulfur content).

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5.4 BACT Analysis for the Cooling Towers

Particulate from cooling towers is generated by the presence of dissolved and suspended solids in the cooling tower circulation water, which is potentially lost as “drift” or moisture droplets that are suspended in the air moving out of the cooling tower. A portion of the water droplets emitted from the tower exhausts will evaporate, leaving the suspended or dissolved solids in the atmosphere.

Particulate emissions from cooling towers can be controlled by minimizing the amount of water drift that occurs and/or minimizing the amount of dissolved solids in the water. This can be accomplished by using high efficiency drift eliminators, a decreased number of cycles of circulating water concentration, or a combination of both. The number of cycles of water concentration is limited by the amount of water available for use, since lower levels of concentration require increased cooling tower blowdown and more water intake to offset the blowdown.

Drift eliminators are a technically feasible control option for particulate emissions from cooling towers. There are no significant energy, environmental, or economic impacts that would preclude the use of drift eliminators for this project. RBLC database search shows drift eliminators as the proposed BACT in the range of 0.0005% weight control up to 0.001% weight. Refer to Attachment C for further details.

LCH proposes to use drift eliminators that limit the drift loss to 0.001% weight for CTW-100, which is consistent with TCEQ BACT guidelines for cooling towers (updated August 2011) and to 0.0005% for CTW-200, per vendor data.

5.5 BACT Analysis for the Oil Water Separator

The oil water separator (OWS) will have a maximum throughput of 200 gallons per hour and 96,000 gallons per year. The oils that enter the oil water separator will be turbine oils with low vapor pressure (<0.02 psia). Due to the low vapor pressure of the product in the OWS, there will likely only be negligible VOC releases. Good operating practices, including use of low vapor pressure products is proposed as BACT for this source.

5.6 BACT Analysis for the Diesel and Gasoline Storage Tanks

The Lon C. Hill Power Station diesel storage tanks will have capacities of 700 gallons or less and the gasoline tank will have a capacity of 250 gallons or less. Diesel has a low vapor pressure (below 0.5 psia) and all three tanks have small capacities. LCH proposes to use fixed roof tanks with submerged fill-pipes to meet current TCEQ BACT requirements.

5.7 BACT Analysis for the Site Fugitive Emissions

Fugitive emissions may be generated from the natural gas delivery system, the ammonia delivery system and the diesel delivery system. These fugitive emissions were estimated using TCEQ recommended

Section 6

Regulatory Applicability Analysis

6.1 State Regulations

30 TAC Chapter 101 – General Rules

The Lon C. Hill Power Station will be operated according to the General Rules relating to circumvention, nuisance, traffic hazards, notification requirements for emissions events, notification requirements for scheduled maintenance/startup/shutdowns, sampling, sampling ports, emissions inventory requirements, sampling procedures and terminology, compliance with Environmental Protection Agency Standards, the National Primary and Secondary Air Quality Standards, inspection fees, emissions fees, and all other applicable General Rules.

30 TAC Chapter 106 – Permit By Rule

Should LCH authorize any future facility by using Chapter 106 PBR, the facility will comply with all requirements as applicable.

30 TAC Chapter 111 – Control of Air Pollution from Visible Emissions and Particulate Matter

The operation of the combined cycle units (CC-101 & CC-102), and cooling towers (CTW-100 and CTW-200) will comply with the opacity limits specified in §111.111.

The emissions of the combined cycle units (CC-101 and CC-102), lube oil vents (CC-101, CC-102 and ST-103) and cooling towers (CTW-100 and CTW-200) will also comply with the allowable particulate matter emission rate specified in §111.151 and as summarized in Table 10 below. A sample calculation for compliance demonstration follows:

The sample calculation is shown for the Unit 101 Combined Cycle stack (EPN: STK-101):

Stack Height (h)	= 152 ft
Stack Exit Diameter (De)	= 22 ft
Stack Exit Velocity (ve)	= 44.63 ft/s
Stack Exit Temperature (Te)	= 194.95°F = 654.62°R
Stack Effluent Flow (q)	= 1,017,923 acfm
PM Estimated Maximum Emissions	= 29.70 lb/hr (proposed allowable)

The Effective Stack Height (he) is calculated as [§111.151(c)]:

$$\begin{aligned}
 h_e &= h + 0.083 * v_e * D_e * [1.5 + 0.82 * ((T_e - 550) / T_e) * D_e] \\
 &= 152 + 0.083 * 44.63 * 22 * [1.5 + 0.82 * ((654.62 - 550) / 654.62) * 44.63] \\
 &= 152.0 \text{ ft} + 0.083 * 44.63 \text{ ft/sec} * 22.0 \text{ ft} * [1.5 + 0.82 * (654.62 \text{ R} - 550 \text{ R}) / 654.62 \text{ R} * 22.0 \text{ ft}] = \\
 &= 509.21 \text{ ft}
 \end{aligned}$$

The Standard Effective Stack Height (He) is calculated as (using interpolation equation provided for Table 2 Standard Effective Stack Heights in §111.151):

$$\begin{aligned}
 H_e &= 1.05 * q^{0.35} \\
 &= 1.05 * (1,017,923)^{0.35} = 133.01 \text{ ft}
 \end{aligned}$$

Because the Effective Stack Height (he) is greater than the Standard Effective Stack Height (He), the PM emission rate interpolated from data in Table 1 in §111.151 does not require an adjustment.

The PM emission limit (E) is calculated per Table 1 in §111.151 as:

$$\begin{aligned}
 E &= 0.048 * q^{0.62} \\
 &= 0.048 * (1,017,923)^{0.62} = 254.70 \text{ lb/hr}
 \end{aligned}$$

Thus, the proposed allowable maximum PM emission rate of 29.70 lb/hr from the combined cycle (EPN STK-101) is less than the §111.151 allowable limit of 254.70 lb/hr.

Table 10 – 30 TAC 111.151 Particulate Matter Limit Verification

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30 TAC Chapter 112 – Control of Air Pollution from Sulfur Compounds

The maximum ground level SO₂ concentration due to the routine and MSS emissions from sources in this application will be below 0.4 part per million by volume (ppmv) averaged over any 30-minute period, as required by §112.3(a).

The net ground level sulfuric acid concentration due to the sources in this application (both routine and MSS) will be below the limits specified in §112.41 as follows:

- a net ground level concentration of 15 µg per cubic meter of air averaged over any 24-hour period;
- a net ground level concentration of 50 µg per cubic meter of air averaged over a one-hour period of time more than once during any consecutive 24-hour period; or
- a net ground level concentration of 100 µg per cubic meter of air maximum at any time.

Compliance with the SO₂ net ground level concentration requirement specified in §112.3 will be demonstrated through an air dispersion modeling analysis which will be submitted separately.

30 TAC Chapter 113 – Control of Air Pollution from Toxic Materials

Chapter 113 regulates the emissions of radon from phosphogypsum stacks (40 CFR 61, Subpart R), hazardous air pollutants for source categories (40 CFR 63), designated facilities (municipal solid waste landfills and hospital/medical/infectious waste incinerators), and consolidated federal air rule SOCMII sources (40 CFR 65). Chapter 113, Subchapter C incorporates the requirements of 40 CFR 63 by reference.

The Lon C. Hill Power Station will not have the potential to emit more than 25 tpy of aggregated HAPs or 10 tpy of any single HAP as summarized in Table 11.

Table 11 – Sitewide HAPs Emission Rates Summary Table

EPN	Max. Individual HAP (tpy)	Total Combined HAP (tpy)
STK-101	2.6	8,2
STK-102	2.6	8,2
Total Sitewide	5.1	16.5
Is Site Major Source for HAPs?	NO	NO

Therefore, the Lon C. Hill Power Station will not be a major source of HAPs. As a minor source of HAPs, the Lon C. Hill Power Station is potentially subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines (40 CFR, Subpart YYYY), the NESHAP for Stationary Reciprocating Internal Combustion Engines (40 CFR 63, Subpart ZZZZ), and the NESHAP for

Industrial, Commercial, and Institutional Boilers and Process Heaters (40 CFR 63, Subpart DDDDD). Refer to the discussion on 40 CFR 63 applicability provided later in this section.

30 TAC Chapter 114 – Control of Air Pollution from Motor Vehicles

The Lon C. Hill Power Station will comply with applicable provisions of this regulation for motor vehicles operated at the site, including maintenance and operation of air pollution control systems or devices and inspection requirements.

30 TAC Chapter 115 – Control of Air Pollution for Volatile Organic Compounds (VOC)

This regulation requires control of VOC emission sources located in specific Texas counties and nonattainment areas. These include general sources, transfer operations, petroleum refining sources, natural gas processes, petrochemical processes, solvent-using processes, miscellaneous industrial sources, consumer-related sources, and sources of highly reactive VOCs. The Lon C. Hill Power Station is located in Nueces County, a covered attainment area, which does have some potentially applicable requirements under this rule. The following is a discussion on the potentially applicable sections of Chapter 115.

Subchapter B – General Volatile Organic Compound Sources

The Lon C. Hill Power Station diesel storage tanks are potentially subject to the regulatory requirements of Chapter 115, Subpart B, Division 1 “Storage of Volatile Organic Compounds”. The proposed 700 gallon tank (TK-101) and 300 gallon tank (TK-102) will store number 2 diesel fuel oil, which has a true vapor pressure less than 1.5 psia. Consequently, the proposed tanks meet the exemptions outlined in §115.111(b)(1) and (8) and are therefore exempt from the requirements of Chapter 115

The Lon C. Hill Power Station oil water separator will be subject to the regulatory requirements of Chapter 115, Subpart B, Division 3 “Water Separation”. The proposed water separator will separate materials, obtained from any equipment on site. At a minimum, the material will have a true vapor pressure of VOC less than 1.5 psia (10.3 kPa), therefore, the proposed unit will meet exemption §115.137(b)(3) and is consequently exempt from §115.132(b) control requirements. Complete, up-to-date records will be maintained to demonstrate continuous compliance with the applicable exemption criteria, including, but not limited to, the names and true vapor pressures of all such materials stored, processed, or handled at the oil water separator, and any other necessary operational information [§115.136(b)(1)].

30 TAC Chapter 116 – Control of Air Pollution by Permits or New Construction or Modification

§116.111 of the Texas Administrative Code (TAC) requires applicants to submit information to demonstrate compliance with Texas Clean Air Act (TCAA) and Federal Regulations. This section provides a summary demonstration that the emission sources associated with this permit application will meet these requirements. Rule language is included in italic blue font to simplify this review.

§116.111(a)(2)(A)(i)

Protection of Public Health and Welfare. The emissions from the proposed facility will comply with all rules and regulations of the commission and with the intent of the TCAA, including protection of the health and property of the public.

As described in Section 6.1 of this application, the Lon C. Hill Power Station will comply with all air quality rules and regulations of the TCEQ and with the intent of the TCAA, including protection of the health and physical property of the public.

§116.111(a)(2)(A)(ii)

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

The emissions from the Lon C. Hill Power Station will comply with the rules and regulations of the TCEQ and the intent of the TCAA. There is one school (Calallen East Elementary School) within 3,000 feet of the plant. Therefore, verification that the emissions from the facility will not result in any short-term or long-term side effects or nuisance odors upon any individual attending the school, is required [§116.111(a)(2)(A)(ii)]. An air quality analysis will be performed based on guidance from the TCEQ permit engineer during the application review. The results of this analysis will be submitted to the TCEQ under a separate cover.

116.111(a)(2)(B)

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

The Lon C. Hill Power Station will have the provisions for measuring the emissions of significant air contaminants as determined by the TCEQ.

§116.111(a)(2)(C)

Best Available Control Technology (BACT). The proposed facility will utilize BACT, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.

The Lon C. Hill Power Station will use the BACT with consideration given to the technical practicality and economic reasonableness of reducing or eliminating emissions from the proposed sources and associated MSS activities as detailed in Section 5 of this application.

§116.111(a)(2)(D)

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

The Lon C. Hill Power Station is potentially subject to various NSPS standards under 40 CFR Part 60, as detailed in Section 6.2.1 of this application.

§116.111(a)(2)(E)

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

The Lon C. Hill Power Station is potentially subject to a NESHAP standard under 40 CFR Part 61, as detailed in Section 6.2.2 of this application.

§116.111(a)(2)(F)

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

The Lon C. Hill Power Station will constitute an area source of HAP emissions, as shown in Table 11 (30 TAC Chapter 113 applicability review above). Therefore, the site is potentially subject to various NESHAP standards under 40 CFR Part 63, as detailed in Section 6.2.3 of this application.

§116.111(a)(2)(G)

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

The sources presented in this application will perform as represented. Source emissions will not exceed the emission rates represented in Section 4 of this application.

§116.111(a)(2)(H)

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

The Lon C. Hill Power Station is located in Nueces County, an attainment area for all regulated pollutants; therefore, NNSR is not required.

§116.111(a)(2)(I)

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

The Lon C. Hill Power Station will be a new major source as defined in the PSD regulations. As described in Section 7, PSD significance thresholds are exceeded for NO₂, CO, VOC and PM₁₀/PM_{2.5} for both routine and MSS operations; therefore, PSD review is required for these pollutants.

§116.111(a)(2)(J)

Air dispersion modeling. Computerized air dispersion modeling may be required by the executive director to determine air quality impacts from a proposed new facility or source modification. In determining whether to issue, or in conducting a review of, a permit application for a shipbuilding or ship repair operation, the commission will not require and may not consider air dispersion modeling results predicting ambient concentrations of non-criteria air contaminants over coastal waters of the state. The commission shall determine compliance with non-criteria ambient air contaminant standards and guidelines at land-based off-property locations.

Dispersion modeling will be provided for the proposed project.

§116.111(a)(2)(K)

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

The Lon C. Hill Power Station will constitute an area source of HAP emissions, as shown in Table 11 (30 TAC Chapter 113 applicability review above). Therefore, the site is potentially subject to various NESHAP standards under 40 CFR Part 63, as detailed in Section 6.2.3 of this application.

§116.111(a)(2)(L)

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

The Lon C. Hill Power Station is not subject to the Mass Emissions Cap and Trade Program, Chapter 101, Subchapter H, Division 3 because it is not located in the Houston/Galveston/Brazoria (HGB) nonattainment area.

30 TAC Chapter 117 – Control of Air Pollution from Nitrogen Compounds

This regulation requires control of NO_x for general sources including industrial, commercial and institutional sources as well as combustion engines in specific areas of Texas. The Lon C. Hill Power Station is located in an attainment county (Nueces). The following is a discussion of the potentially applicable sections of Chapter 117.

Subchapter E – Division 1 – Utility Electric Generation in East and Central Texas

The provisions of this division do not apply to the Lon C. Hill Power Station, since it is a new site and therefore, was not placed into service before December 31, 1995 [§117.3000 (a)(3)].

Subchapter E – Division 4 – East Texas Combustion

The Lon C. Hill Power Station is located in Nueces County which is not an affected county under Chapter 117, therefore, the provisions of this division do not apply [§117.3300].

30 TAC Chapter 118 – Control of Air Pollution Episodes

There are no requirements applicable to the emission units addressed in this application in Chapter 118. Should the requirements of Chapter 118 become applicable to the Lon C. Hill Power Station, the facility will comply with the requirements.

30 TAC Chapter 122 – Federal Operating Permits

LCH previously operated the Lon C. Hill Power Station, a grandfathered Electric Generating Facility, under Federal Operating Permit (FOP) No. O-41. This plant ceased operation in 2002. A Standard Permit (81494) and a Title V Permit (O-2955) were issued for a proposed combined cycle unit that was never constructed. Both permits were eventually voided and the site was fully demolished between 2008 and 2011. The currently proposed redevelopment project will be a new major source and will trigger 30 TAC 122. LCH will submit the required Title V permit application.

6.2 Federal Regulations

6.2.1 40 CFR 60 – New Source Performance Standards

Subpart Dc – Standards of Performance for Small Industrial Steam Generating Units

NSPS Subpart Dc applies to steam generating units that are constructed, modified, or reconstructed after June 9, 1989, with a heat input capacity less than 100 MMBtu/hr but greater than 10 MMBtu/hr.

The Lon C. Hill Power Station HRSGs duct burners design capacities and construction dates meet the requirements for 40 CFR 60 Subpart KKKK; therefore, these units are not subject to Subpart Dc.

Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984

This regulation applies to volatile organic liquid storage vessels with a storage capacity greater than 75 cubic meters (19,813 gallons) and constructed, reconstructed, or modified after July 23, 1984. Lon C. Hill Power Station will not have volatile organic liquids storage vessels with a storage capacity greater than 75 cubic meters (19,813 gallons); therefore, this subpart does not apply.

Subpart GG – Standards of Performance Stationary Gas Turbines

The Lon C. Hill Power Station gas turbines design capacities and construction dates will meet the requirements for 40 CFR 60 Subpart KKKK; therefore, Subpart GG is not applicable [§60.4305(b)].

Subpart VVa – Standards of Performance for Equipment Leak of VOC in SOCMI for which Construction Commenced After November 7, 2006

The Lon C. Hill Power Station will not produce, as an intermediate or final product, any of the chemicals referenced in 40 CFR §60.489a; therefore, it is not an affected facility and is not subject to the requirements of this subpart.

Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

No stationary compression ignition internal combustion engines are proposed at this point, though plant design contemplates the installation of a diesel fired emergency generator and a firewater pump diesel engine. Shall these units be deemed necessary they will be authorized under PBR §106.512 and will comply with Subpart IIII as applicable to these engines.

Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

No stationary spark ignition internal combustion engines are proposed in the redevelopment of the Lon C. Hill Power Station. Therefore, Subpart JJJJ does not apply.

Subpart KKKK – Standards of Performance for Stationary Combustion Turbines

The Lon C. Hill Power Station proposed combustion turbines, heat recovery steam generators (HRSGs), and duct burners (CC-101 and CC-102), are subject to this subpart. As outlined in §60.4305(b) of Subpart KKKK, the stationary combustion turbines are exempt from NSPS GG (concerning stationary gas turbines) and the heat recovery steam generators and duct burners are exempt from NSPS Subpart Da, Db, and Dc (related to steam generating units) since Subpart KKKK applies to these sources instead. The combined cycle units will comply with NSPS Subpart KKKK as applicable.

6.2.2 40 CFR 61 National Emission Standards for Hazardous Air Pollutants

Subpart M – National Emission Standard for Asbestos

The facility could potentially be subject to Subpart M, Standards for Demolition and Renovation [§61.145]. The facility will comply with this regulation should it become applicable.

6.2.3 40 CFR 63 National Emission Standards for Hazardous Air Pollutants for Source Categories

Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers

The MACT for industrial process cooling towers applies to certain cooling towers operated with chromium based water treatment chemicals. The proposed cooling towers (CTW-100 and CTW-200) will not operate with chromium based water treatment chemicals; therefore, Subpart Q does not apply.

Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

This subpart establishes national emission limitation and operating limitations for HAP emissions from stationary combustion turbines located at major sources of HAP emissions. Since the Lon C. Hill Power Station is an area source of HAPS, the two gas combustion turbines are not subject to the Turbine MACT.

Subpart ZZZZ – National Emission Standards for Stationary Reciprocating Internal Combustion Engines (RICE)

Subpart ZZZZ establishes national emission limitations and operating limitations for HAPs emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. If a diesel fired emergency generator and a firewater pump diesel engine are deemed necessary they will be authorized under PBR §106.512 and will comply with Subpart ZZZZ as applicable to these engines, as they would be new stationary RICE located at an area source of HAP emissions [§63.6590(a)(2)(iii)].

An affected source that is a new stationary RICE located at an area source of HAP emissions must meet the requirements of 40 CFR Part 63 through compliance 40 CFR Part 60, Subpart IIII (NSPS IIII) for compression ignition engines [§63.6590(c)(1)]. No further requirements apply for such engines under 40 CFR Part 63. Therefore, if the diesel fired emergency generator and the firewater pump are included in the final design, LCH will guarantee these units comply with all the requirements of NSPS IIII, thereby also complying with the requirements of 40 CFR Part 63, Subpart ZZZZ.

Subpart CCCCCC – National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities

The Lon C. Hill Power Station will be an area source of HAP emissions and may include one or more 55-gallon drums containing gasoline. This fuel will be used in miscellaneous plant equipment. It is expected that no more than three 55-gallon drums of gasoline will be used annually. There will be no gasoline storage tank and no gasoline cargo tank deliveries, therefore, 40 CFR 63 Subpart CCCCCC does not apply.

Subpart JJJJJJ – National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

The Lon C. Hill Power Station will be an area source of HAP emissions and may propose to install a natural gas fired auxiliary boiler onsite, which if deemed necessary will be authorized under either Air Quality Standard Permit for Boilers or PBR §106.183. The auxiliary boiler will be exempt from the requirements of Subpart JJJJJJ, as it will meet the definition of a gas-fired boiler [§63.11195(e)].

6.2.4 40 CFR Part 64 – Compliance Assurance Monitoring

The enhanced monitoring requirements adopted in 40 CFR Part 64 are referred to as Compliance Assurance Monitoring (CAM). CAM is potentially applicable to certain emission sources located at major sources that employ control devices. Applicability for CAM must be determined on a pollutant-by-pollutant basis; therefore, all of the criteria must be satisfied for a particular pollutant for each emission unit to be subject to CAM for that pollutant. CAM is required if all of the following criteria are met and there are no applicable exemptions:

- The emission unit is subject to an emission limitation or standard for an air pollutant (or surrogate thereof) in an applicable requirement;
- The emission unit uses a control device to achieve compliance with the emission limitation or standard; and
- The emission unit has the pre-control device potential to emit greater than or equal to the amount in tons per year required for a site to be classified as a major source.

The Lon C. Hill Power Station proposed combined cycle units (CC-101 and CC-102) will be equipped with DLN combustors and SCR to control NO_x emissions. Since CAM requirements do not apply to emission limitations or standards proposed by the EPA after November 15, 1990 (i.e., NSPS KKKK), or emission limitations or standards under the Acid Rain Program, NO_x emissions from CC-101 and CC-102 are not subject to CAM.

Units CC-101 and CC-102 will be also be equipped with a CO catalyst to control CO emissions. However, there is no specific emission limitation or standard for CO that is applicable to the combustion turbines and/or duct burners. Therefore, CO emissions from CC-101 and CC-102 are not subject to CAM.

6.2.5 40 CFR Part 68 – Chemical Accident Prevention and Risk Management Programs

The Lon C. Hill Power Station will use a nineteen percent aqueous ammonia solution. The applicability threshold quantity for ammonia is 20,000 pounds or more for concentrations 20 percent or more [§68.130]. Therefore, Lon C. Hill Power Station will not be subject to the Chemical Accident Prevention Provisions in 40 CFR Part 68.

6.2.6 40 CFR Parts 72 – 77 - Acid Rain Regulations

The Lon C. Hill Power Station will be subject to and will comply with the Federal Acid Rain regulations found at 40 CFR Parts 72 through 77. Compliance with the Acid Rain regulations will require:

- Installation of continuous emission monitoring system;
- Initial certification of the CEMS to be completed by the deadlines specified in §75.4 and prior to use in the Acid Rain Program;
- Development of a quality assurance/quality control (QA/QC) written plan for the CEMS and their components;
- Development and maintenance of a monitoring plan, containing detail information on the CEMS and excepted methodologies (e.g. Part 75 Appendix D) used to demonstrate that all unit SO₂ emissions, NO_x emissions, CO₂ emissions, and opacity are monitored and reported;
- Electronic quarterly reporting according to §75.64;
- Semiannual or annual RATA reports;
- Establishment of a compliance account under the Allowance Tracking System [§73.31];
- Purchase of allowances.

6.2.7 40 CFR Part 82 – Stratospheric Ozone Protection Regulations

Subpart F, Recycling and Emissions Reductions, of 40 CFR Part 82, Protection of Stratospheric Ozone, generally requires that all repairs, service, and disposal of appliances containing Class I or Class II ozone depleting substances are conducted by properly certified persons. The Lon C. Hill Power Station will comply with this regulation should it become applicable.

6.2.8 40 CFR Parts 96 – 97 Clean Air Interstate Rule Permit Requirements

The Lon C. Hill Power Station will be subject to and will comply with the Clean Air Interstate Rule (CAIR) permit requirements. In addition, Lon C. Hill will potentially be subject to the proposed Cross-State Air Pollution Rule (CSAPR), if it is adopted, and will then comply with all requirements under the CSAPR.

6.2.9 40 CFR Part 98 – Mandatory Greenhouse Gas Reporting

The Lon C. Hill Power Station will be an electricity generating facility subject to 40 CFR 98 [§98.2(a)(1)]. As such, it will be required to meet the general requirements of Part 98 Subpart A and the specific

monitoring, calculation methodologies, and recordkeeping and reporting requirements of Subparts C and D.

The Lon C. Hill Power Station affected source categories will include the two combined cycle units (CC-101 and CC-102), as well as fugitive emissions from the natural gas service lines and the circuit breakers.

6.3 Disaster Review

The TCEQ requires a disaster review for any chemicals used on-site that have a reasonable potential to cause off-property impacts that are immediately dangerous to life and health in the event of an accidental release. Lon C. Hill Power Station will not keep onsite any chemical subject to a Disaster Review, and therefore these requirements do not apply.

Section 7

NNSR and PSD Applicability Review

This section describes the Nonattainment New Source Review (NNSR) and Prevention of Significant Deterioration (PSD) applicability analyses associated with the proposed redevelopment of the Lon C. Hill Power Station.

7.1 NNSR Applicability Review

Lon C. Hill Power Station is located in Nueces County, an attainment area for all regulated pollutants. Therefore, NNSR is not required.

7.2 PSD Applicability Review

The Lon C. Hill Power Station is located west of Corpus Christi, Nueces County, in an area that is classified by the U.S. EPA as attainment with the NAAQS for all regulated pollutants. The facility is included as one of the 28-named sources under PSD rules. Therefore, the applicable major source threshold for all attainment pollutants is 100 tpy. Proposed NO_x, CO, VOC and PM₁₀/PM_{2.5} emission rates are in excess of 100 tpy each; therefore, the proposed power plant will be a new major source as defined by the PSD rules (40 CFR §52.21).

All of the sources included in this application are new sources; as such, the project emission rate increases for the sources are based on their proposed allowable emission rates. Table 12 presents the project emission rate increases for the proposed project and compares them to the PSD Significant Emissions Rate (SER) for each pollutant. Tables 1F, 2F and 3F are provided in Attachment D.

Table 12 – PSD Applicability Analysis

Air Pollutant	Project Emission Rate Increase (tpy)	PSD SER (tpy)	Netting Required?	Net Emission Rate Increase (tpy)	PSD Review Required?
NO _x	208.7	40	N/A	208.7	Yes
CO	846.4	100	N/A	846.4	Yes
VOC	143.8	40	N/A	143.8	Yes
PM ₁₀	112.1	15	N/A	112.1	Yes
PM _{2.5}	109.5	10	N/A	109.5	Yes
SO ₂	11.7	40	N/A	11.7	No
H ₂ SO ₄	1.4	7	N/A	1.4	No

Since no emission rate decreases occurred during the contemporaneous period, the net emission rate increases are based on the proposed project emission rate increases. The Lon C. Hill Power Station is, therefore, a new major source and PSD review is required for each regulated pollutant with significant

emissions, as defined in 40 CFR 52 (§52.21(b)(23)). As shown in Table 12, the emission rate increases exceed the SER for the following pollutants: NO_x, CO, VOC and PM₁₀/PM_{2.5}.

The project will also result in an increase in GHG emissions above the 75,000 tpy CO₂e PSD major source threshold. US EPA Region 6 currently reviews all GHG permit applications for the State of Texas; therefore, a separate PSD GHG permit application will be submitted to US EPA Region 6.

7.3 BACT/LAER Requirements

Federal BACT analysis is required for all pollutants that trigger PSD review. Section 5 of this permit application demonstrates that the proposed facilities will meet BACT requirements for all applicable emission sources. LAER does not apply to any facilities or pollutants because NNSR is not triggered for the project.

7.4 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 preconstruction monitoring for NO₂, CO, VOC and PM₁₀/PM_{2.5}. 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.

7.5 Air Quality Analysis

An air quality modeling analysis is required to demonstrate the proposed emission rates will not cause or contribute to a violation of any NAAQS or PSD Increment for pollutants subject to PSD review (NO₂, CO, VOC and PM₁₀/PM_{2.5}). The TCEQ may also require a demonstration of compliance with the NAAQS and TCEQ property line standards and with Effect Screening Levels for other pollutants. Any air quality analysis will be performed based on guidance from the TCEQ permit engineer during the application review. The results of this analysis will be submitted to the TCEQ under a separate cover.

7.6 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 requirements will be addressed as part of the air quality analysis report.



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary (GE Turbine)

Date:	May 1, 2014	Permit No.:	114911 - PSDTX1380	Regulated Entity No.:	RN100215979
Area Name:	Lon C Hill Power Station			Customer Reference No.:	CN602656688

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) LB/HR	(B) TPY
STK-101	CC-101	Unit 101 Combined Cycle (GT+HRSG)	NOx	18.7	
			NOx (startup/shutdown)	206.8	
			CO	11.4	
			CO (startup/shutdown)	3,137.2	
			VOC	6.5	
			VOC (startup/shutdown)	359.7	
			SO ₂	35.9	
			PM ₁₀ /PM _{2.5}	16.0	
			H ₂ SO ₄	4.2	
			NH ₃	24.2	
			NH ₃ (startup/shutdown)	34.0	
STK-102	CC-102	Unit 102 Combined Cycle (GT+HRSG)	NOx	18.7	
			NOx (startup/shutdown)	206.8	
			CO	11.4	
			CO (startup/shutdown)	3,137.2	
			VOC	6.5	
			VOC (startup/shutdown)	359.7	
			SO ₂	35.9	
			PM ₁₀ /PM _{2.5}	16.0	
			H ₂ SO ₄	4.2	
			NH ₃	24.2	
			NH ₃ (startup/shutdown)	34.0	
STK-101 & STK-102	CC-101 & CC-102	Unit 101 Combined Cycle (GT+HRSG) Unit 102 Combined Cycle (GT+HRSG)	NOx		194.0
			NOx (startup/shutdown)		
			CO		837.3
			CO (startup/shutdown)		
			VOC		139.5
			VOC (startup/shutdown)		
			SO ₂		11.0
			PM ₁₀ /PM _{2.5}		109.5
			H ₂ SO ₄		1.3
			NH ₃		185.0
			NH ₃ (startup/shutdown)		
LOVSTK-101	CC-101	Unit 101 GT Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.003	0.01
LOVSTK-102	CC-102	Unit 102 GT Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.003	0.01
LOVSTK-103	ST-103	ST Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.01	0.05



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary (GE Turbine)

Date:	May 1, 2014	Permit No.:	114911 - PSDTX1380	Regulated Entity No.:	RN100215979
Area Name:	Lon C Hill Power Station			Customer Reference No.:	CN602656688

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) LB/HR	(B) TPY
CTW-100	CTW-100	Cooling Tower 1	PM ₁₀	0.8	2.3
			PM _{2.5}	0.003	0.01
CTW-200	CTW-200	Cooling Tower 2	PM ₁₀	0.05	0.24
			PM _{2.5}	0.0002	0.001
OWS-100	OWS-100	Oil Water Separator	VOC	1.0	0.2
TKSTK-101	TK-101	Diesel Tank (Emergency Generator)	VOC	0.03	0.0001
TKSTK-102	TK-102	Diesel Tank (Firewater Pump)	VOC	0.01	0.0001
TKSTK-103	TK-103	Gasoline Tank	VOC	2.89	0.01
FUGNG-100	FUGNG-100	Fugitive Natural Gas Service	VOC	0.1	0.4
FUGSCR-100	FUGSCR-100	Fugitive Ammonia Service	NH ₃	0.01	0.04
FUGDS-100	FUGDS-100	Fugitive Diesel Service	VOC	0.05	0.24
PURG-100	PURG-100	MSS Fuel Purging Emissions	VOC	0.01	0.004
OFFWASH-100	CC-101 and CC-102	MSS Offline Turbine Washing	VOC	1.3	0.003

EPN = Emission Point Number

FIN = Facility Identification Number



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary (Worst Case)

Date:	May 1, 2014	Permit No.:	114911 - PSDTX1380	Regulated Entity No.:	RN100215979
Area Name:	Lon C Hill Power Station			Customer Reference No.:	CN602656688

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) LB/HR	(B) TPY
STK-101	CC-101	Unit 101 Combined Cycle (GT+HRSG)	NOx	18.7	
			NOx (startup/shutdown)	206.8	
			CO	11.7	
			CO (startup/shutdown)	3,137.2	
			VOC	6.5	
			VOC (startup/shutdown)	359.7	
			SO ₂	35.9	
			PM ₁₀ /PM _{2.5}	29.7	
			H ₂ SO ₄	4.2	
			NH ₃	24.2	
			NH ₃ (startup/shutdown)	34.0	
STK-102	CC-102	Unit 102 Combined Cycle (GT+HRSG)	NOx	18.7	
			NOx (startup/shutdown)	206.8	
			CO	11.7	
			CO (startup/shutdown)	3,137.2	
			VOC	6.5	
			VOC (startup/shutdown)	359.7	
			SO ₂	35.9	
			PM ₁₀ /PM _{2.5}	29.7	
			H ₂ SO ₄	4.2	
			NH ₃	24.2	
			NH ₃ (startup/shutdown)	34.0	
STK-101 & STK-102	CC-101 & CC-102	Unit 101 Combined Cycle (GT+HRSG) Unit 102 Combined Cycle (GT+HRSG)	NOx		208.7
			NOx (startup/shutdown)		
			CO		846.4
			CO (startup/shutdown)		
			VOC		142.9
			VOC (startup/shutdown)		
			SO ₂		11.7
			PM ₁₀ /PM _{2.5}		109.5
			H ₂ SO ₄		1.4
			NH ₃		199.7
			NH ₃ (startup/shutdown)		
LOVSTK-101	CC-101	Unit 101 GT Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.003	0.01
LOVSTK-102	CC-102	Unit 102 GT Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.003	0.01
LOVSTK-103	ST-103	ST Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.01	0.05



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary (Worst Case)

Date:	May 1, 2014	Permit No.:	114911 - PSDTX1380	Regulated Entity No.:	RN100215979
Area Name:	Lon C Hill Power Station			Customer Reference No.:	CN602656688

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) LB/HR	(B) TPY
CTW-100	CTW-100	Cooling Tower 1	PM ₁₀	0.8	2.3
			PM _{2.5}	0.003	0.01
CTW-200	CTW-200	Cooling Tower 2	PM ₁₀	0.05	0.24
			PM _{2.5}	0.0002	0.001
OWS-100	OWS-100	Oil Water Separator	VOC	1.0	0.2
TKSTK-101	TK-101	Diesel Tank (Emergency Generator)	VOC	0.03	0.0001
TKSTK-102	TK-102	Diesel Tank (Firewater Pump)	VOC	0.01	0.0001
TKSTK-103	TK-103	Gasoline Tank	VOC	2.89	0.01
FUGNG-100	FUGNG-100	Fugitive Natural Gas Service	VOC	0.1	0.4
FUGSCR-100	FUGSCR-100	Fugitive Ammonia Service	NH ₃	0.01	0.04
FUGDS-100	FUGDS-100	Fugitive Diesel Service	VOC	0.05	0.24
PURG-100	PURG-100	MSS Fuel Purging Emissions	VOC	0.01	0.004
OFFWASH-100	CC-101 and CC-102	MSS Offline Turbine Washing	VOC	1.3	0.003

EPN = Emission Point Number

FIN = Facility Identification Number

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary (Siemens Turbine)

Date:	May 1, 2014	Permit No.:	114911 - PSDTX1380	Regulated Entity No.:	RN100215979
Area Name:	Lon C Hill Power Station			Customer Reference No.:	CN602656688

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

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) LB/HR	(B) TPY
STK-101	CC-101	Unit 101 Combined Cycle (GT+HRSG)	NOx	18.5	
			NOx (startup/shutdown)	206.8	
			CO	11.7	
			CO (startup/shutdown)	3,137.2	
			VOC	6.5	
			VOC (startup/shutdown)	359.7	
			SO ₂	35.3	
			PM ₁₀ /PM _{2.5}	29.7	
			H ₂ SO ₄	4.1	
			NH ₃	24.0	
			NH ₃ (startup/shutdown)	34.0	
STK-102	CC-102	Unit 102 Combined Cycle (GT+HRSG)	NOx	18.5	
			NOx (startup/shutdown)	206.8	
			CO	11.7	
			CO (startup/shutdown)	3,137.2	
			VOC	6.5	
			VOC (startup/shutdown)	359.7	
			SO ₂	35.3	
			PM ₁₀ /PM _{2.5}	29.7	
			H ₂ SO ₄	4.1	
			NH ₃	24.0	
			NH ₃ (startup/shutdown)	34.0	
STK-101 & STK-102	CC-101 & CC-102	Unit 101 Combined Cycle (GT+HRSG) Unit 102 Combined Cycle (GT+HRSG)	NOx		208.7
			NOx (startup/shutdown)		
			CO		846.4
			CO (startup/shutdown)		
			VOC		142.9
			VOC (startup/shutdown)		
			SO ₂		11.7
			PM ₁₀ /PM _{2.5}		99.4
			H ₂ SO ₄		1.4
			NH ₃		199.7
			NH ₃ (startup/shutdown)		
LOVSTK-101	CC-101	Unit 101 GT Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.003	0.01
LOVSTK-102	CC-102	Unit 102 GT Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.003	0.01
LOVSTK-103	ST-103	ST Lube Oil Vent	PM ₁₀ /PM _{2.5}	0.01	0.05



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary (Siemens Turbine)

Date:	May 1, 2014	Permit No.:	114911 - PSDTX1380	Regulated Entity No.:	RN100215979
Area Name:	Lon C Hill Power Station			Customer Reference No.:	CN602656688

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AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) NAME		(A) LB/HR	(B) TPY
CTW-100	CTW-100	Cooling Tower 1	PM ₁₀	0.8	2.3
			PM _{2.5}	0.003	0.01
CTW-200	CTW-200	Cooling Tower 2	PM ₁₀	0.05	0.24
			PM _{2.5}	0.0002	0.001
OWS-100	OWS-100	Oil Water Separator	VOC	1.0	0.2
TKSTK-101	TK-101	Diesel Tank (Emergency Generator)	VOC	0.03	0.0001
TKSTK-102	TK-102	Diesel Tank (Firewater Pump)	VOC	0.01	0.0001
TKSTK-103	TK-103	Gasoline Tank	VOC	2.89	0.01
FUGNG-100	FUGNG-100	Fugitive Natural Gas Service	VOC	0.1	0.4
FUGSCR-100	FUGSCR-100	Fugitive Ammonia Service	NH ₃	0.01	0.04
FUGDS-100	FUGDS-100	Fugitive Diesel Service	VOC	0.05	0.24
PURG-100	PURG-100	MSS Fuel Purging Emissions	VOC	0.01	0.004
OFFWASH-100	CC-101 and CC-102	MSS Offline Turbine Washing	VOC	1.3	0.003

EPN = Emission Point Number

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