Construction Permit
Source Analysis & Technical Review

Company	**SL Energy Power Plant I, LLC**	Permit Number	**177380, PSDTX1650, and GHGPSDTX244**
City	**Lexington**	Project Number	**379025**
County	**Lee**	Regulated Entity Number	**RN111987863**
Project Type	**Initial**	Customer Reference Number	**CN606272417**
Project Reviewer	**Huy Pham, P.E.**	Received Date	**August 29, 2024**
Site Name	**SL Energy Power Plant I**		

Project Overview

SL Energy Power Plant I, LLC (SL Energy) proposes to construct and operate a power generation plant, consisting of two natural gas combined cycle gas turbines, for public and private electricity consumption in Lexington, Lee County, Texas.

The total nominal maximum power output for the two combustion turbines when the duct burners are in service is 1,240.2 MW at the International Organization for Standardization (ISO) 3977 ambient conditions of 59°F, 60% relative humidity, and sea level elevation. Maintenance, Startup, and Shutdown (MSS) activities are being authorized in this permit.

Emission Summary

Air Contaminant	Proposed Allowable Emission Rates (tpy)[a]
PM	153.48
PM_{10}	153.48
$PM_{2.5}$	153.48
VOC	92.89
NO_X	254.28
CO	168.22
SO_2	49.58
H_2SO_4	75.57
NH_3	461.15
CO_2	3,866,675.45
CH_4	124.40
N_2O	7.28
SF_6	<0.01
CO_2e	3,885,537.73
CH_2O	7.32
HAPs[b]	17.76

[a]For an initial permit at a greenfield site, the baseline actual emissions (BAE) are zero. Therefore, the proposed allowable emission rates also represent the project emissions increases.
[b]The site will not be a major source of HAPs.

Compliance History Evaluation - 30 TAC Chapter 60 Rules

A compliance history report was reviewed on:	January 5, 2025
Site rating & classification:	unclassified (New greenfield site, as there are no other active permits for the subject RN)
Company rating & classification:	N/A
Has the permit changed on the basis of the compliance history or rating?	No
Did the Regional Office have any comments? If so, explain.	No

Public Notice Information

Requirement	Date
Legislator letters mailed	9/4/2024
Date 1^{st} notice published	9/12/2024
Publication Name: Austin American Statesman	
Pollutants: carbon monoxide, hazardous air pollutants, nitrogen oxides, organic compounds, particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, sulfur dioxide, sulfuric acid, and greenhouse gases.	
Date 1^{st} notice Alternate Language published	9/17/2024
Publication Name (Alternate Language): La Prensa Communidad	
1^{st} public notice tearsheet(s) received	9/19/2024
1^{st} public notice affidavit(s) received	9/19/2024
1^{st} public notice certification of sign posting/application availability received	10/21/2024
SB709 Notification mailed	9/26/2024; re-issued 3/6/2025
Date 2^{nd} notice published	
Publication Name:	
Pollutants:	
Date 2^{nd} notice published (Alternate Language)	
Publication Name (Alternate Language):	
2^{nd} public notice tearsheet(s) received	
2^{nd} public notice affidavit(s) received	
2^{nd} public notice certification of sign posting/application availability received	

Public Interest

Number of comments received	1
Number of meeting requests received	2
Number of hearing requests received	2

Date meeting held	
Date response to comments filed with OCC	
Date of SOAH hearing	

Federal Rules Applicability

Requirement		
Subject to NSPS?		**Yes**
Subparts	**A, Dc, IIII, KKKK, & TTTTa**	
Subject to NESHAP?		**No**
Subparts	**N/A**	
Subject to NESHAP (MACT) for source categories?		**No**
Subparts	**A** & **ZZZZ**	

Nonattainment review applicability:
The power plant will be located in Lee County, which is currently designated as an area of attainment for all criteria pollutants. Therefore, Nonattainment review does not apply.

PSD review applicability:
The site will be a major named source with respect to PSD due to being a permitted fossil fuel-fired steam electric plant with greater than 250 MMBtu/hr heat input and having the project emissions increase exceed the major source thresholds of 100 tpy for criteria pollutants. The Baseline Actual Emissions (BAE) associated with this initial permit are zero since this is a new greenfield site with no existing emissions. The site will emit 100 tpy or more of CO, NO_x, PM, PM_{10}, $PM_{2.5}$ and be subject to PSD for these pollutants. Contemporaneous netting does not apply to new greenfield sites or other existing PSD minor sources. All other pollutants were then evaluated for significance. The project emissions increases of VOC, SO_2, and H_2SO_4 exceed the associated Significant Emissions Rate (SER). Therefore, PSD review applies to VOC, SO_2, and H_2SO_4 as well.

PSD review also applies to greenhouse gas (GHG) since PSD review is triggered for other pollutants, and the project has a GHG as CO_2e emissions increase of greater than 75,000 tpy CO_2e. All global warming potentials (GWP) are based on 89 Federal Register 31802 Revisions and Confidentiality Determinations for Data Elements Under the Greenhouse Gas Reporting Rule, effective January 1, 2025.

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)	NO_X (tpy)	CO (tpy)	SO_2 (tpy)	H_2SO_4 (tpy)	GHG as CO_2e (tpy)
Project Increases	153.48	153.48	153.48	92.89	254.28	168.22	49.58	75.57	3,885,537.73
PSD Major Source Threshold	100 for each pollutant								75,000
Significant Emission Rate	25	15	10	40	40	100	40	7	N/A

Title V Applicability - 30 TAC Chapter 122 Rules

Requirement
Title V applicability: The SL Energy power plant will be subject to Title V, and SL Energy will submit an application for a new Title V operating permit prior to operation of the proposed power plant.
Periodic Monitoring (PM) applicability: The site will be a major source for Title V and subject to the 30 TAC 122 periodic monitoring requirements. The following provisions for monitoring related to this initial project are included in the special conditions: • Continuous fuel flow monitoring and recording of the natural gas fuel usage for the turbines and duct burners; • Quarterly visible emissions/opacity observations from the gas turbines' stacks; • Initial stack testing of NOx, CO, VOC, NH_3, PM_{10}, SO_2, and O_2 from the gas turbines; • Raw data files of CEMS for NOx, CO, NH_3, and O_2 from the gas turbines; • Records of dates, times, durations, and estimated emissions for startups and shutdowns of the gas turbines; • Monthly and rolling 12-month average output specific CO_2e emission rate monitoring and recordkeeping; • Sampling of natural gas used for the gas turbines, boiler, and heaters every 6 months to determine total sulfur and net heating value, unless test results from the fuel supplier are used; • Monthly recordkeeping of the natural gas fuel usage for the auxiliary boiler using a totalizing fuel flow meter; • Recordkeeping of the hours of operation of the auxiliary boiler; • Records of hours of operation for the emergency generator and emergency fire pump, as well as records of diesel fuel delivery indicating the date and quantity of fuel; • Monthly recordkeeping of the number of tank trucks unloading ammonia for the gas turbines; • Monthly storage tank liquid throughput records; • 28AVO leak detection and repair (LDAR) program inspections for piping equipment leak fugitives in ammonia service; • Annual revalidation of inherently low emitting (ILE) MSS activities; • Monthly emission records for non-ILE maintenance activities; • Annual SF_6 emission calculations and records from SF_6 circuit breaker leaks; and • Greenhouse gas (GHG) monitoring, emission calculations, and recordkeeping requirements.
Compliance Assurance Monitoring (CAM) applicability: CAM is applicable to the gas turbines for NOx, CO, and VOC because each turbine has a pre-control potential-to-emit (PTE) above the major source thresholds as specified in 30 TAC 112.604(b) and 30 TAC 112.10(13), and control devices (SCR and oxidation catalyst) are used to achieve compliance with the emission limitations. CAM is addressed for the turbines through CEMS for NOx and CO to ensure compliance assurance for the SCR and oxidation catalyst. CEMS will be used to measure and record the in-stack and exhaust concentrations of NOx and CO from the combustion turbine to demonstrate compliance with the concentration limits in the permit special conditions. The concentrations will be used in calculation of the emission rates which assures compliance with the emission rate limits in the permit MAERT. The CO CEMS is assumed to be an appropriate surrogate indicator of compliance assurance for VOC since proper use of the oxidation catalyst will ensure proper combustion and control of both CO and VOC.

Process Description and Project Scope

SL Energy Power Plant I, LLC (SL Energy) proposes to construct and operate a power generation plant in Lee County, Texas for public and private consumption. The power plant will consist of two natural gas-fired combined cycle gas turbines (EPNs GT-1 and GT-2) in a 2x2x2 configuration (two turbine trains, each with a dedicated supplemental fired [duct burner] heat recovery steam generator [HRSG] and a dedicated steam turbine). The gas turbines are Siemens model SGT6-9000HL Advanced Class Gas Turbines. The total nominal maximum power output for the two combustion turbines when each duct burner is in service is approximately 1,240.2 MW at the International Organization for Standardization (ISO) 3977 ambient conditions of 59°F, 60% relative humidity, and sea level elevation. Each turbine and duct burner train will have a total maximum firing rate of 4,083 MMBtu/hr (Higher Heating Value [HHV]).

SL Energy has stated that electricity will be sold to the state electric grid, with about 80 MW sold to the public during ERCOT system peak periods. Electricity will continue to be sold to the public until all of the private customers have completed projects slated to accept the power being generated by these two turbines. Both gas turbines are expected to operate up to 8,076 hours per year each, which includes periods of startup and shutdown.

The following is the process description for the proposed SL Energy power plant.

Combustion Turbine and Heat Recovery Steam Generator (HRSG)
For each turbine train, filtered ambient air is drawn into the compressor section of the turbine and mixed with natural gas to be combusted in the combustor section. During periods of warm to hot ambient temperatures, evaporative cooling may be used to lower the temperature of the inlet air and increase the mass air flow through the turbine to achieve maximum turbine power output. Hot exhaust gases then enter the expansion turbine and expand across the turbine, which generates torque that causes rotation of the turbine shaft. The shaft drives the compressor section of the unit and spins the dedicated electric generator, producing electricity.

Exhaust from the combustion turbine then passes through a HRSG where boiler feed water is converted into high pressure steam. Natural gas-fired duct burners increase the temperature of the combustion turbine exhaust. A steam turbine generator receives the steam from the HRSG. The expansion of the high-pressure steam across the steam turbine causes rotation of the steam turbine shaft, producing electricity. The gas turbine and HRSG duct firing combustion emissions will vent to the atmosphere via the HRSG exhaust stack for each train (EPNs GT-1 and GT-2).

SL Energy stated that a bypass operation when the steam turbine(s) is out of service can occur. During this time, the exhaust heat from the combustion turbine still passes through the HRSG, but a 100% steam bypass is used to allow for steam generated in the HRSG to bypass the steam turbine and be routed directly to the air-cooled condenser where it is cooled, condensed, and returned to the HRSG for cooling. The exhaust gas is still treated with the ammonia SCR system to reduce NOx. The path of the gas and emissions is not affected during bypass mode, except that duct firing is not utilized since the steam turbine is not in service to generate from the additional steam, so bypass operation will still result in emissions from the same stack (EPNs GT-1 and GT-2). SL Energy states that bypass capability greatly facilitates plant startups and shutdowns, reducing the duration needed.

Ancillary Equipment and Sources
The two combustion turbines and two steam turbines will have a dedicated lube oil system for each train. The lube oil systems are used to lubricate the moving parts of the turbines. Emissions of condensed lube oil droplets from the lube oil systems will be exhausted through vapor extraction vents serving the proposed unit, and these emissions will be controlled with mist eliminators (EPNs LOV-1 and LOV-2). Two lube oil tanks (EPN LOT-1 and EPN LOT-2, respectively) will be used to provide lube oil for the two systems. Additional ancillary equipment includes one natural gas fueled auxiliary boiler (EPN AUX-1), two natural gas fueled fuel water bath heaters (EPNs FH-1 and FH-2), one diesel fueled emergency generator (EPN GEN-1), one diesel fueled emergency fire pump (EPN FP-1), two diesel tanks (EPNs EGDT-1 and EFDT-1), 12 high voltage circuit breakers (EPN CB-1), and fugitive piping equipment in natural gas service (EPN NGFUG-1), ammonia service (EPN AFUG-1), and diesel service (DFUG-1).

Steam is produced in the two heat recovery steam generators and the auxiliary waste heat boiler. The steam will be used to drive two Siemens SST6-5000 steam turbines driving two Siemens SGEN-3000W generators to produce electricity. Used steam from the turbine exhaust is condensed in an enclosed non-contact cooling system and recycled for reuse in the process.

SL Energy stated this non-contact cooling system is also characterized as a dry cooling system, which does not operate as a typical ‘wet’ cooling tower where process water comes in direct contact with ambient air. This dry cooling system cools and condenses the steam by passing large volumes of air over enclosed steam and condensate piping. Air Cooled Condensers (ACCs), which are finned tube heat exchangers, are used to remove the heat. The turbine exhaust is directed via a duct to the inlet of the ACC and is forced through the finned tubes similar to a commercial HVAC condenser. Simultaneously, cool ambient air forced across the exterior of the finned tubes removes heat from the steam passing through the tubes, and condensation occurs. The condensate is then pumped back to the HSRG in a closed loop. The SL Energy Station industrial scale ACC’s will be of an elevated Mechanical Indirect Dry Cooling Tower (MIDCT) A-Frame design that draws cooling air from ground level, forces it vertically through the A-Frame heat exchanger and exhausts the warmed air out the top. No steam, condensate, or water is exposed to the atmosphere during the cooling process, so no typical wet cooling tower emissions (VOC, PM, PM_{10}, or $PM_{2.5}$) are produced.

One Auxiliary Boiler (AUX-1) will be used to produce steam and drive the steam turbines during combined cycle turbine outages. During a normal startup of the gas turbine, the auxiliary boiler will be placed in service to pre-warm the HRSG, pre-warm the steam turbine, to set seals, and to pull vacuum on the steam turbine exhaust. The boiler will remain in service after the gas turbine is started until the HRSG is hot enough to generate saturated steam from the gas turbine, which is estimated to be 20 minutes. The boiler would then be shut down. The diesel-powered emergency engine will provide power to the site during power outages. The diesel-powered emergency fire pump will provide emergency firefighting capabilities to the site.

A maximum of 19 percent aqueous ammonia by weight will be used to control NOx in the SCR. Aqueous ammonia will be delivered to the plant by tank truck and unloaded into ammonia storage tanks. The tankers will not be pressurized and not be offloaded under pressure. During filling of the ammonia tank, all vapors will be vented back (vapor balanced) to the transport tanker as the storage tank(s) is filled. SL Energy will ensure that the ammonia supplier complies with all vapor balancing requirements. SL Energy also has in place procedures and protocols for on-site delivery, filling, and handling of aqueous ammonia per OSHA's Process Safety Management of Highly Hazardous Chemicals standard (29 CFR 1910.119) and will only accept deliveries from reputable, proven suppliers who fully comply with Federal DOT Requirements. The ammonia storage tank will be rated for 50 psia and since the tank safeties are set at 50 psi, heating of the ammonia tank due to daily cyclical heating will not be sufficient to raise the pressure of the tank to a level that will result in emissions from standing losses.

The generator circuit breakers associated with the proposed units will be insulated with SF_6. The gas is used for electrical insulation, arc quenching, and current interruption in high-voltage electrical equipment. Fugitive emissions of SF_6 are designated as EPN CB-1.

Planned Maintenance, Startup, and Shutdown (MSS) Activities
Planned startup and shutdown of the proposed combined cycle turbines will occur at the site, which result in elevated CO, NOx, and VOC emissions and concentration limits compared to the emissions and concentration limits during routine, steady-state turbine operation. SL Energy has defined a planned startup of the combined cycle turbine(s) as the period beginning when the combustion turbine receives a "turbine start" signal, when fuel is introduced, and an initial flame detection signal is recorded by the plant's control system. The planned startup ends when the combustion turbine output achieves steady operation (greater than 35% capacity) in the low NOx operating mode, the SCR has achieved steady state operation, and the startup emissions have purged through the continuous emissions monitoring system (CEMS), thereby achieving emissions compliance.

SL Energy has defined a planned shutdown period as the period beginning when the combustion turbine receives a shutdown command and the combustion turbine operating level drops below its minimum sustainable load (less than 35% capacity), and the ammonia injection is no longer in service for purposes of an intended shutdown (i.e., shutdown of the ammonia system was not caused by a system failure). The planned shutdown period ends when a flame detection signal is no longer recorded in the plant's control system. Each startup and shutdown activity are expected to last for less than an hour in duration.

Planned maintenance activities (EPN MSS-1) include turbine blade washing, miscellaneous air intake filter changeouts, CEMS analyzer and other process instrument calibrations, inlet fuel line venting, repair and replacement of small equipment and fugitive components, catalyst handling, and sludge management. For turbine blade washing, VOC-containing cleaning chemicals may be used. Sludge is collected on-site and then shipped off-site.

Risk Management Plan (RMP) and Disaster Review Determination
SL Energy has stated that the aqueous ammonia planned to be stored will have a maximum 19 weight percent ammonia, which is below the 20-weight percent threshold requiring a Risk Management Plan (RMP) according to the threshold quantities specified in Tables 1 and 2 of 40 CFR 68.130. A disaster review is also not triggered for the storing and handling of aqueous ammonia.

Best Available Control Technology
The EPA accepts the TCEQ's three-tier approach to BACT as equivalent to the EPA's top-down approach to BACT for PSD review when the following are considered: recently issued/approved permits within the state of Texas, recently

issued/approved permits in other states, and control technologies contained within the EPA's RBLC database for the specified source. For pollutants subject to PSD review, the Applicant conducted a search of the RACT/BACT/LAER Clearinghouse (RBLC), the TCEQ Turbine List, and recently-approved permits for combined cycle gas turbines and similar emissions sources authorized in Texas and other states. State minor BACT was evaluated for pollutants not subject to PSD review.

Source Name	EPN	Best Available Control Technology Description
Combined Cycle Gas Turbine 1	GT-1	The combustion turbines and supplemental duct burners will be fired exclusively with pipeline quality natural gas. The individual maximum firing rate for each combustion turbine is 3,758 MMBtu/hr (HHV), while the maximum specified firing rate for each duct burner is 348 MMHBtu/hr (HHV). However, no turbine train will be operated at the maximum turbine firing rate and the maximum duct burner firing rate simultaneously. Instead, the combustion turbine and supplemental duct burner for either train will have a maximum total firing rate of approximately 4,083 MMBtu/hr (HHV). The pollutant emission factors are provided by equipment suppliers and EPA's AP-42 emission factor database. Both hourly and annual emission calculations are based on the worst-case scenario from the manufacturer's performance guarantee, which occurs when the turbine is operating at 100% load, the duct burners are operating, evaporative cooling is not used, ambient temperature is -5.0°F, relative humidity is 20.0%, and barometric pressure is 14.45 psia. Annual emissions are based on up to 8,060 hours of steady-state operation each year and additional contributions from expected startup and shutdown operations. **NOx:** Each turbine is limited to a 2-ppmvd stack concentration at 15 percent oxygen (% O_2) on a rolling 3-hour average with or without duct burner firing. Dry Low-NOx (DLN) burners, an ammonia-based Selective catalytic reduction (SCR) system, and good combustion practices are used to achieve this concentration limit and reduce NOx emissions. **CO:** Each turbine is limited to a 2 ppmvd stack concentration at 15% O_2 on a rolling 3-hour average with or without duct burner firing. An oxidation catalyst and good combustion practices are used to achieve this concentration limit and reduce CO emissions. **VOC:** Each turbine is limited to a 2 ppmvd stack concentration at 15% O_2 on a rolling 24-hour average with or without duct burner firing. An oxidation catalyst and good combustion practices are used to achieve this emission limit. **SO_2 and H_2SO_4:** Each turbine, including the duct burners, is limited to firing pipeline quality natural gas with a sulfur content of up to 0.5 grains per 100 dry standard cubic feet (gr S/100 dscf). To estimate emissions of SO_2, it is assumed that there is 100% conversion of the sulfur in the fuel to SO_2. To estimate emissions of H_2SO_4, it is conservatively assumed that 100% of SO_2 produced is converted to SO_3 and then to H_2SO_4 with no additional conversion to $(NH_4)_2SO_4$ particulate matter. **PM/PM_{10}/$PM_{2.5}$:** Pipeline quality natural gas and good combustion practices are used to limit particulate matter emissions. Each turbine is proposed to meet 0.0046 lb/MMBtu, as guaranteed by the turbine manufacturer, Siemens Energy. This emission factor includes all filterable and condensable particulate matter, including any ammonium sulfate $(NH_4)_2SO_4$ particulate matter that may be formed in the SCR unit from reaction of H_2SO_4 mist with ammonia in the
Combined Cycle Gas Turbine 2	GT-2	

		exhaust stream. Emissions of PM_{10} and $PM_{2.5}$ are conservatively assumed to equal PM. No technically feasible post-combustion control technologies are available to reduce particulate matter emissions from gas turbines due to the large amount of excess air inherent to the turbine operation and would create an unacceptable amount of backpressure. **HAPs:** Total HAPs emissions, including formaldehyde, are estimated using the 0.000408 lb/MMBtu emission factor according to EPA AP-42 Table 3.1-3. **NH_3:** The ammonia slip from each turbine is limited to 10.0 ppmvd stack concentration at 15% O_2 on a rolling 3-hour average. The SCR system will be operated in a manner to minimize ammonia slip. **MSS:** Elevated hourly CO, NOx, and VOC emissions and concentrations are expected during startup and shutdown operation compared to routine, steady-state operation. Higher NOx emissions and concentrations are produced during transition of the combustors to low NOx operating mode and the ineffectiveness of using an SCR during the transition. Higher CO and VOC emissions and concentrations occur due to more incomplete combustion as the combustion turbine transitions to the normal operating mode and the ineffectiveness of using the oxidation catalyst during the transition. Startup and shutdown emissions are estimated based on 8 startups and shutdowns per year per turbine. Cold startups, warm startups, and shutdown events are each expected to last less than an hour in duration. Since the startup and shutdown activities are less than 1-hour in duration, the emissions estimates for startup and shutdown provided by the manufacturer had been extrapolated into 1-hour rates to assume the activities each last a full hour. The result is a conservative estimate of a full hour in which a startup or shutdown occurs. The duration of MSS activities will be minimized, the amount of time the turbine is outside the performance mode where emissions controls (e.g. SCR and oxidation catalyst systems) can be used will be minimized, and best management practices and good air pollution control practices are used. **GHG as CO_2e:** Each turbine will comply with 40 CFR NSPS TTTTa requirements and operate as base load units (annual capacity factor greater than 40%). Therefore, the gross power-output based GHG emissions for each unit are limited to 800 lb CO_2/MWh on a 12-month operating month average during all operation, as specified at 40 CFR 60.5580(a) and Table 1 of NSPS Subpart TTTTa. Effective January 1, 2032 however, the gas turbine will be subject to a 100 lb CO_2/MWh gross power-output based GHG emission limit instead, according to NSPS TTTTa. SL Energy has proposed the thermal efficiency of each unit to be 454 lb CO_2/MW-hr at base load (579.5 lbs CO_2/MWh gross) on a 12-month rolling average, which is well below the 800 lb/MW-hr standard prior to January 1, 2032. GHG emissions are expected to be less during startup and shutdown compared to GHG emissions during baseload conditions since there will typically be no duct burner firing, and the firing rate of natural gas to the combustion turbine will be lower as well. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD

		review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Lube Oil Vent 1	LOV-1	A dedicated lube oil system will be used for each gas turbine and the associated steam turbine. Emissions of condensed lube oil droplets from the lube oil systems will be exhausted through vapor extraction vents serving the combustion turbine and steam turbine. BACT is satisfied through use of oil mist eliminators to remove fine oil droplets from the air flow of the vapor extraction vents and minimize emissions. The unloading, storage, and heated recirculation of lube oil are estimated to emit equal to or less than 0.3 gallons per day of oil lost per vent, based on the oil consumption for similar units and operations. Lube oil is assumed to be emitted as VOC, PM, PM_{10}, and $PM_{2.5}$. Lube oil vent emissions are estimated based on 8,060 hours of operation per year, similar to turbine operation. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Lube Oil Vent 2	LOV-2	
Auxiliary Boiler 1	AUX-1	The auxiliary boiler will have a maximum heat input of 84 MMBtu/hr (HHV) and be fired exclusively with pipeline quality natural gas. The auxiliary boiler provides additional steam for the steam turbines 1 and 2 (associated with HRSGs 1 and 2, respectively) during combined cycle turbine outages. The boiler also prewarms the HRSGs to appropriate temperature to generate saturated steam during startup of the gas turbines. The boiler will operate up to 2,000 hours per year. **NOx:** The boiler is limited to 0.01 lb NOx/MMBtu, as guaranteed by the equipment manufacturer. Dry low NOx burners and good combustion practices are used to achieve this emission limit and reduce NOx emissions. **CO:** The boiler is limited to 50 ppmvd CO stack concentration at 3% O_2, as guaranteed by the equipment manufacturer. Good combustion practices are used. **VOC:** The boiler VOC emissions are estimated at 5.5 lb/10^6 scf according to EPA AP-42 Table 1.4-2. Good combustion practices are used. **SO_2:** The boiler is fired exclusively with pipeline quality natural gas based on 0.5 gr S/100 dscf of natural gas supplied by the natural gas supplier. **PM/PM_{10}/$PM_{2.5}$:** The boiler is limited to 0.008 lb particulate matter/MMBtu, as guaranteed by the equipment manufacturer. Emissions of PM_{10} and $PM_{2.5}$ are conservatively assumed to equal PM. **HAPs:** Total HAPs, including formaldehyde, are estimated using the 0.08111 lb/10^6 scf emission factor according to EPA AP-42 Table 1.4-3. **GHG as CO_2e:** The boiler is limited to 117.10 lb CO_2e/MMBtu according to 40 CFR 98 Tables C-1 and C-2. Good combustion practices are used. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently

		issued/approved permits in Texas and in other states.
Fuel Water Bath Heater 1	FH-1	The two fuel water bath heaters will heat up the natural gas fuel prior to entering turbines and the auxiliary boiler. The heaters each have a maximum heat input of 14 MMBtu/hr and will be fired exclusively with pipeline quality natural gas. Only a single heater is expected to be able to heat the entire fuel gas supply for both gas turbines and boiler, while the other heater will be used as a spare. There will be a brief overlap period where both heaters are technically in service. Therefore, the annual emissions for each heater are included in an annual emissions cap (EPN FH-CAP), which is based on a total of 8,760 hours of operation per year of one heater. **NOx:** The heaters are limited to 0.01 lb/MMBtu, as guaranteed by the equipment manufacturer. Good combustion practices are used. **CO:** The heaters are limited to 50 ppmvd CO stack concentration at 3% O_2. Good combustion practices are used. **VOC:** The heaters' VOC emissions are estimated at 5.5 lb/10^6 scf according to EPA AP-42 Table 1.4-2. Good combustion practices are used. **SO_2:** The heaters are fired exclusively with pipeline quality natural gas based on 0.5 gr S/100 dscf of natural gas supplied by the natural gas supplier. **PM/PM_{10}/$PM_{2.5}$:** The heaters are limited to 0.008 lb particulate matter/MMBtu, as guaranteed by the equipment manufacturer. Emissions of PM_{10} and $PM_{2.5}$ are conservatively assumed to equal PM. **HAPs:** Total HAPs, including formaldehyde, are estimated using the 0.08111 lb/10^6 scf emission factor according to EPA AP-42 Table 1.4-3. **GHG as CO_2e:** The heaters are limited to 117.10 lb CO_2e/MMBtu according to 40 CFR 98 Tables C-1 and C-2. Good combustion practices are used. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Fuel Water Bath Heater 2	FH-2	
Fuel Water Bath Heater Cap	FH-CAP	
Emergency Generator 1	GEN-1	The Caterpillar Model 3516C 2,500 kW emergency generator is rated for 3,352.5 bhp/hr and limited to operate up to 52 hours per year for testing purposes, charging batteries, and checking critical operating parameters to ensure it is ready in case of emergencies. Ultra-low sulfur content diesel fuel and good combustion practices are used. The generator will be equipped with a non-resettable runtime meter. The emergency generator meets the requirements of 40 CFR Part 60, Subpart IIII based on the requirement in 40 CFR §60.4200(a)(2)(i). The emergency generator engine model is 2024, the displacement is less than 10 liters per cylinder, and the emission standards found in 40 CFR §60.4202(b)(2) apply. The manufacturer-guaranteed NOx, VOC, CO, and particulate matter emission factors are below the specified 40 CFR §60.4202(b)(2) standards. NOx is limited to 5.32 g/bhp-hr (0.0117286 lb/bhp-hr), VOC is limited to 0.1 g/bhp-hr (0.00063934 lb/bhp-hr), CO is limited to 0.42 g/bhp-hr (0.0009259 lb/bhp-hr), and PM is limited to 0.05 g/bhp-hr (0.00011023 lb/bhp-hr). Emissions of PM_{10} and $PM_{2.5}$ are conservatively assumed to equal PM.

		SO_2 emissions are estimated using a 0.0000121 lb/bhp-hr emission factor determined from EPA AP-42 Chapter 3.4, Table 3.4-1 with a diesel sulfur content of 15 ppmw. Total HAPs, including formaldehyde, are estimated using a 0.00157398 lb/MMBtu emission factor according to EPA AP-42 Tables 3.4-3 and 3.4-4. GHG as CO_2e emissions are limited to 163.59 lb/MMBtu according to 40 CFR 98 Subpart C Table C-1. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Emergency Fire Pump 1	FP-1	The Cummins model CFP15E-F10 Emergency Fire Pump is rated for 488 bhp/hr and limited to operate up to 52 hours per year for testing purposes, charging batteries, and checking critical operating parameters to ensure it is ready in case of emergencies. Ultra-low sulfur content diesel fuel and good combustion practices are used. The fire pump will be equipped with a non-resettable runtime meter. The emergency fire pump meets the requirements of 40 CFR Part 60, Subpart IIII based on the requirement in 40 CFR §60.4200(a)(2)(ii). The engine model is 2024, and the emission standards found in Table 4 of 40 CFR 60 Subpart IIII apply. The manufacturer-guaranteed NOx, VOC, CO, and particulate matter emission factors are below the specified Table 4 standards. NOx is limited to 2.565 g/bhp-hr (0.005654862 lb/bhp-hr), VOC is limited to 0.086 g/bhp-hr (0.000189598 lb/bhp-hr), CO is limited to 0.671 g/bhp-hr (0.0014793 lb/bhp-hr), and PM is limited to 0.078 g/bhp-hr (0.000171961 lb/bhp-hr). Emissions of PM_{10} and $PM_{2.5}$ are conservatively assumed to equal PM. SO_2 emissions are estimated using a 0.0000121 lb/bhp-hr emission factor determined from EPA AP-42 Chapter 3.4, Table 3.4-1 with a diesel sulfur content of 15 ppmw. Total HAPs, including formaldehyde, are estimated using a 0.00157398 lb/MMBtu emission factor according to EPA AP-42 Tables 3.4-3 and 3.4-4. GHG as CO_2e emissions are limited to 163.59 lb/MMBtu according to 40 CFR 98 Subpart C Table C-1. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Lube Oil Tank 1	LOT-1	The lube oil tanks and diesel tanks will be horizontal, fixed roof tanks equipped with submerged fill and have uninsulated surfaces exposed to the sun be white. Diesel and lube oil have vapor pressures less than 0.5 psia at the maximum operating temperature. Note, the emissions from the lube oil tanks were estimated using a molecular weight of 600 lb/lb-mole, which is conservative in determining the emissions estimates. Lube oil will be stored in two approximately 28,000 gallon tanks, each with a maximum fill rate of 8,000 gallons per hour and annual net throughput of 8,109.5 gallons per year. A 5,000 gallon tank will be used to store diesel for the emergency generator, while a 500 gallon tank will be used to store diesel for the
Lube Oil Tank 2	LOT-2	
Emergency Generator 1 Diesel Tank	EGDT-1	
Emergency Fire Pump 1 Diesel Tank	EFDT-1	

		emergency fire pump. The estimated diesel usage for the emergency generator 1 diesel tank is 5,000 gallons per hour and 5,000 gallons per year. The estimated diesel usage for the emergency fire pump 1 diesel tank is 500 gallons per hour and 500 gallons per year. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for VOC triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Natural Gas, Ammonia, and Diesel Fugitives	NGFUG-1, AFUG-1, DFUG-1	Fugitive equipment leaks may occur from piping equipment in natural gas, ammonia, and diesel service. The EPA emission factors for SOCMI facilities without ethylene are used. BACT is satisfied for ammonia fugitive leaks through use of the 28AVO leak detection and reduction (LDAR) program to reduce ammonia emissions. Inspections are performed once every four hours (three times per 12-hour shift). The uncontrolled VOC emissions from piping fugitive components at the site are less than 10 tpy. Therefore, no control is required as BACT for VOC emissions from piping fugitive components in natural gas and diesel service. However, daily audio, visual, and olfactory (AVO) inspections are required to monitor fugitive leaks in natural gas service based on BACT for GHG emissions from natural gas piping equipment supporting natural gas fired turbines. No control credit is claimed for these inspections of the natural gas fugitive piping components. GHG as CO_2e: Natural gas is assumed to have a maximum 93.6% methane by weight. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Circuit Breakers	CB-1	Circuit breakers will be insulated with SF_6, which is a colorless, odorless, and non-flammable gas. SF_6 contributes to greenhouse gas emissions and has a global warming potential of 23,500. Potential leaks of SF_6 can occur from high-pressure electrical switchgear. Twelve high voltage circuit breakers will be installed at the facility, with each circuit breaker having a capacity of 128 pounds of sulfur hexafluoride. The predicted SF_6 annual leak rate is 0.5% by weight. BACT for GHG emissions is satisfied through use of state-of-the-art enclosed pressure SF_6 gas circuit breakers equipped with low-pressure SF_6 alarms and low-pressure lockout. The alarm will alert operating personnel of any leakage in the system and the lockout prevents any operation of the breaker in the event there is a lack of “quenching and cooling” SF_6 gas. An AVO inspection program is implemented to detect and minimize leaks. Boilerplate requirements were added to the permit except that the Applicant has requested that each circuit breaker be equipped with a SF_6 leak detection system able to detect a leak of 0.5% per year instead of 1 lb. The representation of 0.5 weight percent SF_6 is lower than the 1 lb SF_6 requirement as boilerplate. Therefore, this change is more stringent than the 1 lb SF_6 requirement and is a lower leak detection threshold, and result in identifying leaks more frequently than the 1 lb SF_6 requirement. The Applicant provided RBLC searches that were reviewed, and the

		proposed BACT stated above for GHG as CO_2e triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.
Maintenance Activities	MSS-1	Maintenance activities proposed from the site include: A. Turbine blade washing will primarily occur with only demineralized wash water and result in emissions of PM, PM_{10}, and $PM_{2.5}$. A representative cleaning chemical (ZOK 27) containing VOC may be used with up to 36 gallons of cleaning chemical per cleaning and up to 4,082 gallons of cleaning chemical per year. To be conservative, all of the VOC emissions from turbine blade washing occur during the washing process and the entire VOC content of the cleaning chemical is emitted during the process. Only one washing per turbine per hour will occur. Up to 336 turbine blade washings are estimated per year. B. Any miscellaneous filter maintenance where baghouses and air intake filters for turbines need to be replaced and result in particulate matter emissions, including PM, PM_{10}, and $PM_{2.5}$. Four total changes per year are estimated. C. CEMS analyzer and other process instrument calibrations, inspections, repair, replacement, and testing result in emissions of CO, NOx, and VOC. This can include other sight glasses, gauges, meters, etc. Up to 375 total events per year are estimated. D. Inlet fuel line venting which results in VOC emissions. Portions of the natural gas fuel delivery system may need to be evacuated during maintenance. Venting is estimated to occur for up to 228 hours per year. E. Repair/replacement of small equipment and fugitive piping components in VOC and NH_3 service, such as pumps, compressors, valves, pipes, flanges, transport lines, and filters/screens in natural gas service, diesel oil service, lube oil service. These activities are assumed to occur for up to 10 hours per year for VOC equipment and up to 24 hours for NH_3 equipment. F. Any sludge management, which can include management by vacuum truck/dewatering of material in open pits/ponds/sumps/tanks, other closed or open vessels, or water conveyances. Material managed typically includes water and sludge materials containing miscellaneous VOCs such as diesel, lube oil, and other waste oils. Wastewater is generated on an intermittent basis, will contain sludge from the process, and is conservatively estimated that one percent of the crude oil is VOC. G. SCR catalyst and oxidation catalyst handling, including cleaning with vacuum trucks. Catalyst handling results in emissions of PM, PM_{10}, and $PM_{2.5}$. These activities are assumed to occur for up to five hours per year. The proposed maintenance activities are required to ensure proper operability and safety of equipment. All maintenance activities are limited through best management practices (BMP) for minimizing formation and release of air contaminants. The frequency and duration of MSS activities will be minimized to the extent practicable such that calculated emissions will be low enough to be classified as inherently low emitting (ILE) activities. Emissions estimates shall be

		revalidated annually for all inherently low emitting MSS activities. GHG as CO_2e emissions occur from natural gas emitted from the gaseous fuel venting maintenance activity and the small equipment repair and replacement activity. Natural gas is assumed to have a maximum 93.6% methane by weight. The Applicant provided RBLC searches that were reviewed, and the proposed BACT stated above for each pollutant triggering PSD review is consistent with the RBLC searches and recently issued/approved permits in Texas and in other states.

Impacts Evaluation

Was modeling conducted? **Yes**	Type of Modeling: **AERMOD version 23132**
Is the site within 3,000 feet of any school?	**Yes, the River View Christian Academy is about 2,200 feet East of the site. The Adina Christian Church is just outside of the 3,000 feet radius East of the site.**
Additional site/land use information: The surrounding area, there are residences scattered surrounding the site.	

Alliance Technical Group, on behalf of SL Energy Power Plant I, LLC, conducted air dispersion modeling via AERMOD, including PSD modeling and a minor NAAQS analysis, which was all audited by the Air Dispersion Modeling Team. Based on the results of the dispersion model, no short-term or long-term adverse health effects are expected to occur among the public health, welfare, or the environment as a result of exposure to the emissions from the facilities authorized under this permit. The results are summarized below and were deemed acceptable for all review types and pollutants.

Table 1. Modeling Results for PSD De Minimis Analysis
in Micrograms Per Cubic Meter ($\mu g/m^3$)

Pollutant	Averaging Time	GLCmax[1] (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	4.1	7.8
SO_2	3-hr	4	25
SO_2	24-hr	3	5
$SO_{2\ (Increment)}$	Annual	0.3	1
PM_{10}	24-hr	9	5
PM_{10}	Annual	1.4	1
$PM_{2.5}$	24-hr	9	1.2
$PM_{2.5}$	Annual	1.35	0.13
NO_2	1-hr	113	7.5
NO_2	Annual	2	1
CO	1-hr	1251	2000
CO	8-hr	983	500

Table 2. Modeling Results for Ozone PSD De Minimis Analysis in Parts per Billion (ppb)

Pollutant	Averaging Time	GLCmax (ppb)	De Minimis (ppb)
O_3	8-hr	0.4	1

Table 3. Modeling Results for PSD Monitoring Significance Levels

Pollutant	Averaging Time	GLCmax (µg/m^3)	Significance (µg/m^3)
SO_2	24-hr	3	13
PM_{10}	24-hr	9	10
NO_2	Annual	2	14
CO	8-hr	983	575

1 Ground level maximum concentration

Table 4. Total Concentrations for PSD NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax (µg/m^3)	Background (µg/m^3)	Total Conc. = [Background + GLCmax] (µg/m^3)	Standard (µg/m^3)
PM_{10}	24-hr	7	86	93	150
$PM_{2.5}$	24-hr	5	21	26	35
$PM_{2.5}$	Annual	1.3	7.3	8.6	9
NO_2	1-hr	109	41	150	188
NO_2	Annual	2	4	6	100
CO	8-hr	969	580	1549	10000

Table 5. Results for PSD Increment Analysis

Pollutant	Averaging Time	GLCmax (µg/m^3)	Increment (µg/m^3)
PM_{10}	24-hr	8	30
PM_{10}	Annual	1	17
$PM_{2.5}$	24-hr	8	9
$PM_{2.5}$	Annual	1	4
NO_2	Annual	2	25

Additional Impacts Analysis

The applicant performed an Additional Impacts Analysis as part of the PSD AQA. The applicant conducted a growth analysis and determined that population will not significantly increase as a result of the proposed project. The applicant conducted a soils and vegetation analysis and determined that all evaluated criteria pollutant concentrations are below their respective secondary NAAQS. The applicant meets the Class II visibility analysis requirement by complying with the opacity requirements of 30 Texas Administrative Code Chapter 111. The Additional Impacts Analyses are reasonable and possible adverse impacts from this project are not expected.

ADMT evaluated predicted concentrations from the proposed project to determine if emissions could adversely affect a Class I area. The nearest Class I area, Wichita Mountains Wildlife Refuge, is located approximately 492 kilometers (km) from the proposed site.

The H_2SO_4 24-hr maximum predicted concentration of 3.75 µg/m^3 occurred along FM Road 1786, which bisects the project site. The H_2SO_4 24-hr maximum predicted concentration occurring at the edge of the receptor grid, 50 km from the proposed sources, in the direction of the Wichita Mountains Wildlife Refuge Class I area is 0.03 μg/m³. The Wichita Mountains Wildlife Refuge Class I area is an additional 442 km from the edge of the receptor grid. Therefore, emissions of H_2SO_4 from the proposed project are not expected to adversely affect the Wichita Mountains Wildlife Refuge Class I area.

The predicted concentrations of PM_{10}, $PM_{2.5}$, NO_2, and SO_2 for all averaging times, are all less than de minimis levels at a distance of 50 km from the proposed sources in the direction the Wichita Mountains Wildlife Refuge Class I area. The Wichita Mountains Wildlife Refuge Class I area is an additional 442 km from the location where the predicted concentrations of PM_{10}, $PM_{2.5}$, NO_2, and SO_2 for all averaging times are less than de minimis. Therefore, emissions from the proposed project are not expected to adversely affect the Wichita Mountains Wildlife Refuge Class I area.

Minor Source NSR and Air Toxics Analysis

Table 6. Site-Wide Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax (μg/m³)	Standard (μg/m³)
SO_2	1-hr	4	1021
H_2SO_4	1-hr	6	50
H_2SO_4	24-hr	4	15

All health effects pollutants were evaluated under Step 7: 'Sitewide modeling' of the TCEQ Modeling and Effects Review Applicability (MERA) guidance document (APDG 5874) and determined acceptable. As summarized below, all pollutants passed the Toxicology Effects Evaluation Procedure Tier I, which requires that the GLCmax is below the associated ESL. For the annual averaging time for pollutants that are not specified below, such as ammonia and formaldehyde, the pollutant passes step 0 of the MERA, which states that the long-term ESL must be equal to or greater than ten percent of the associated short-term ESL.

Table 7. Minor NSR Site-Wide Modeling Results for Health Effects

Pollutant	CAS#	Averaging Time	GLCmax (μg/m³)	GLCmax Location	ESL (μg/m³)
ammonia	7664-41-7	1-hr	68	E Fence Line	180
formaldehyde	50-00-0	1-hr	1	25m E Fence Line	15
toluene	108-88-3	1-hr	25	E Fence Line	4500
naphthalene	91-20-3	1-hr	1	25m E Fence Line	440
benzene	71-43-2	1-hr	25	E Fence Line	170
benzene	71-43-2	Annual	0.1	E Fence Line	4.5
acetaldehyde	75-07-0	1-hr	1	25m E Fence Line	120
acrolein	107-02-8	1-hr	1	25m E Fence Line	3.2

ethylbenzene	100-41-4	1-hr	25	E Fence Line	26000
ethylbenzene	100-41-4	Annual	0.1	E Fence Line	570
xylene	1330-20-7	1-hr	25	E Fence Line	2200
xylene	1330-20-7	Annual	0.1	E Fence Line	180
1,3-butadiene	106-99-0	1-hr	6	25m E Fence Line	510
1,3-butadiene	106-99-0	Annual	0.01	Fence Line that Bisects Main Fenced Property	9.9
polycyclic aromatic hydrocarbons	130498-29-2	1-hr	0.3	Fence Line that Bisects Main Fenced Property	0.5
sulfur hexafluoride	2551-62-4	1-hr	1	E Fence Line	60000
n-hexane	110-54-3	1-hr	24	E Fence Line	5600
n-hexane	110-54-3	Annual	0.1	E Fence Line	200
cumene	98-82-8	1-hr	30	E Fence Line	650
diesel fuel	68334-30-5	1-hr	586	25m E Fence Line	1000
lubricating oils, petroleum, hydrotreated, spent	64742-58-1	1-hr	511	E Fence Line	1000
n-butane	106-97-8	1-hr	1758	E Fence Line	66000
propylene oxide	75-56-9	1-hr	6	25m E Fence Line	70
alcohol, ethoxylated, not otherwise specified	N/A	1-hr	511	E Fence Line	600
2-propanol-1-butoxy	5131-66-8	1-hr	85	E Fence Line	730
oleoyl sarcosine	110-25-8 (Vapor)	1-hr	85	E Fence Line	1000
benzotriazole derivative	127519-17-9	1-hr	17	E Fence Line	120

More detailed information regarding the air quality analysis can be found in the ADMT modeling memo dated February 21, 2025, Central File Room Content ID 7613830**.**

DRAFT

Project Reviewer	Date	Team Leader	Date
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