TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

EXAMPLE A

NOTICE OF APPLICATION AND PRELIMINARY DECISION FOR AN AIR QUALITY PERMIT

PROPOSED AIR QUALITY PERMIT NUMBERS: 119365 AND PSDTX1410

APPLICATION AND PRELIMINARY DECISION. Colorado Bend II Power, LLC, has applied to the Texas Commission on Environmental Quality (TCEQ) for issuance of Proposed Air Quality Permit 119365 and Prevention of Significant Deterioration (PSD) Air Quality Permit PSDTX1410, which would authorize construction of additional electric generating units at the Colorado Bend Energy Center located at 3863 South State Highway 60, near Wharton, Wharton County, Texas 77488. This application is being processed in an expedited manner, as allowed by the commission's rules in 30 Texas Administrative Code, Chapter 101, Subchapter J. This application was submitted to the TCEQ on April 18, 2014. The proposed facility will emit the following air contaminants in a significant amount: particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less, carbon monoxide, nitrogen oxides, sulfur dioxide, volatile organic compounds, and sulfuric acid mist. In addition, the facility will emit the following air contaminants: ammonia.

The degree of PSD increment predicted to be consumed by the proposed facility and other increment-consuming sources in the area is as follows:

Nitrogen Dioxide

Maximum Averaging Time	**Maximum Increment Consumed (µg/m³)**	**Allowable Increment (µg/m³)**
Annual	3	25

PM_{10}

Maximum Averaging Time	**Maximum Increment Consumed (µg/m³)**	**Allowable Increment (µg/m³)**
24-hour	13	30

$PM_{2.5}$

Maximum Averaging Time	**Maximum Increment Consumed (µg/m³)**	**Allowable Increment (µg/m³)**
24-hour	8.4	9
Annual	0.7	4

The executive director has determined that the emissions of air contaminants from the proposed facility which are subject to PSD review will not violate any state or federal air quality regulations and will not have any significant adverse impact on soils, vegetation, or visibility. All air contaminants have been evaluated, and "best available control technology" will be used for the control of these contaminants.

The executive director has completed the technical review of the application and prepared a draft permit which, if approved, would establish the conditions under which the facility must operate. The permit application, executive director's preliminary decision, draft permit, and the executive director's preliminary determination summary and executive director's air quality analysis will be available for viewing and copying at the TCEQ central office, the TCEQ Houston regional office, and the Wharton County Library, 1920 North Fulton, Wharton, Wharton County, Texas, beginning the first day of publication of this notice. The facility's compliance file, if any exists, is available for public review at the TCEQ Houston Regional Office, 5425 Polk Street, Suite H, Houston, Texas.

INFORMATION AVAILABLE ONLINE. The following documents are accessible through the Commission's Web site at www.tceq.texas.gov/goto/cid: the executive director's preliminary decision which includes the draft permit, the executive director's preliminary determination summary, the air quality analysis, and, once available, the executive director's response to comments and the final decision on this application. You may access the Commissioners' Integrated Database (CID) by using the above link and entering the permit number for this application. The Wharton County Library provides public access to the internet. The following link to an electronic map of the site or facility's general location is provided as a public courtesy and is not part of the application or notice: http://www.tceq.texas.gov/assets/public/hb610/index.html?lat=29.286666&lng=-96.065555&zoom=13&type=r. For the exact site location, refer to the permit application.

PUBLIC COMMENT/PUBLIC MEETING. You may submit public comments or request a public meeting about this application. The purpose of a public meeting is to provide the opportunity to submit comment or to ask questions about the application. The TCEQ will hold a public meeting if the executive director determines that there is a significant degree of public interest in the application, if requested by an interested person, or if requested by a local legislator. A public meeting is not a contested case hearing. **You may submit additional written public comments within 30 days of the date of newspaper publication of this notice in the manner set forth in the AGENCY CONTACTS AND INFORMATION paragraph below.**

After the deadline for public comment, the executive director will consider the comments and prepare a response to all public comment. **The response to comments, along with the executive director's decision on the application will be mailed to everyone who submitted public comments or is on a mailing list for this application.**

OPPORTUNITY FOR A CONTESTED CASE HEARING. A contested case hearing is a legal proceeding similar to a civil trial in a state district court. **A person who may be affected by emissions of air contaminants from the facility is entitled to request a hearing. A contested case hearing request must include the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "I/we request a contested case hearing;" (4) a specific description of how you would be adversely affected by the application and air emissions from the facility in a way not common to the general public; (5) the location and distance of your property relative to the facility; and (6) a description of how you use the property which may be impacted by the facility. If the request is made by a group or association, then one or more members who have standing to request a hearing and the interests the group or association seeks to protect must also be identified. You may also submit your proposed adjustments to the application/permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing within 30 days following this notice to the Office of the Chief Clerk, at the address provided in the information section below.**

A contested case hearing will only be granted based on disputed issues of fact that are relevant and material to the Commission's decisions on the application. Further, the Commission will only grant a hearing on issues raised by you or others during the public comment period that have not been withdrawn. Issues that are not raised in public comments may not be considered during a hearing.

EXECUTIVE DIRECTOR ACTION. If a timely contested case hearing request is not received or if all timely contested case hearing requests are withdrawn, the executive director may issue final approval of the application. The response to comments, along with the executive director's decision on the application will be mailed to everyone who submitted public comments or is on a mailing list for this application, and will be posted electronically to the CID. If any timely hearing requests are received and not withdrawn, the executive director will not issue final approval of the permit and will forward the application and requests to the Commissioners for their consideration at a scheduled commission meeting.

MAILING LIST. You may ask to be placed on a mailing list to obtain additional information on this application by sending a request to the Office of the Chief Clerk at the address below.

AGENCY CONTACTS AND INFORMATION. Public comments and requests must be submitted either electronically at www.tceq.texas.gov/about/comments.html, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. If you communicate with the TCEQ electronically, please be aware that your email address, like your physical mailing address, will become part of the agency's public record. For more information about this permit application or the permitting process, please call the Public Education Program toll free at 1-800-687-4040. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from Colorado Bend II Power, LLC, 325 North Saint Paul Street, Suite 2650, Dallas Texas 75201-3920 or by calling Mr. Albert M. Hatton III, Senior Environmental Project Manager, at (610) 765-5316.

Notice Issuance Date: February 24, 2015

February 20, 2015 Draft

Emission Sources - Maximum Allowable Emission Rates

Permit Numbers 119365 and PSDTX1410

This table lists the maximum allowable emission rates and all sources of air contaminants on the applicant's property covered by this permit. The emission rates shown are those derived from information submitted as part of the application for permit and are the maximum rates allowed for these facilities, sources, and related activities. Any proposed increase in emission rates may require an application for a modification of the facilities covered by this permit.

Air Contaminants Data

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
CTDB3-A	GE Model 7HA.02 Combustion Turbine (CT) and 770 MMBtu/hr Duct Burner	NO_x (Normal Operation) (5)	28.2	184
		NO_x (MSS Operation) (6)	512	
		CO (Normal Operation) (5)	34	875
		CO (MSS Operation) (6)	7,637	
		VOC (Normal Operation) (5)	19.7	179
		VOC (MSS Operation) (6)	1,324	
		SO_2	22	23.5
		PM (7)	43	110
		PM_{10} (7)	43	110
		$PM_{2.5}$ (7)	43	110
		H_2SO_4	17.3	18.4
		$(NH_4)_2SO_4$	23.3	25
		NH_3	52.2	223
CTDB3-B	GE Model 7HA.02 CT and 770 MMBtu/hr Duct Burner	NO_x (Normal Operation) (5)	28.2	184
		NO_x (MSS Operation) (6)	512	
		CO (Normal Operation) (5)	34	875
		CO (MSS Operation) (6)	7,637	
		VOC (Normal Operation) (5)	19.7	179
		VOC (MSS Operation) (6)	1,324	
		SO_2	22	23.5
		PM (7)	43	110
		PM_{10} (7)	43	110
		$PM_{2.5}$ (7)	43	110
		H_2SO_4	17.3	18.4
		$(NH_4)_2SO_4$	23.3	25
		NH_3	52.2	223

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
CT3-ALOV-VNT	CT 1 Lube Oil Vent	VOC	<0.01	0.013
		PM	<0.01	0.013
		PM_{10}	<0.01	0.013
		$PM_{2.5}$	<0.01	0.013
CT3-BLOV-VNT	CT 2 Lube Oil Vent	VOC	<0.01	0.013
		PM	<0.01	0.013
		PM_{10}	<0.01	0.013
		$PM_{2.5}$	<0.01	0.013
ST3LOV-VNT	Steam Turbine Lube Oil Vent	VOC	<0.01	0.013
		PM	<0.01	0.013
		PM_{10}	<0.01	0.013
		$PM_{2.5}$	<0.01	0.013
FWP2	Fire Water Pump 250 Horsepower Diesel Engine	NO_x	1.5	0.07
		CO	0.22	0.01
		VOC	0.06	<0.01
		PM	0.03	<0.01
		PM_{10}	0.03	<0.01
		$PM_{2.5}$	0.03	<0.01
		SO_2	<0.01	<0.01
EG3	2.0 MW Emergency Generator Diesel Engine	NO_x	35.3	1.8
		CO	1.9	0.10
		VOC	0.71	0.04
		PM	0.16	<0.01
		PM_{10}	0.16	<0.01
		$PM_{2.5}$	0.16	<0.01
		SO_2	0.03	<0.01

Emission Sources - Maximum Allowable Emission Rates

Emission Point No. (1)	Source Name (2)	Air Contaminant Name (3)	Emission Rates	
			lbs/hour	TPY (4)
AUX3	Auxiliary Boiler 40 MMBtu/hr (8)	NO_x	1.5	6.5
		CO	1.5	6.5
		VOC	0.22	0.96
		PM	0.20	0.88
		PM_{10}	0.20	0.88
		$PM_{2.5}$	0.20	0.88
		SO_2	0.23	0.25
NG-FUG	Natural Gas Fugitives (9)	VOC	0.05	0.22
NH3-FUG	Ammonia Fugitives (9)	NH_3	0.12	0.51
DSL-TK1	Diesel Fuel Storage Tank for Emergency Generator	VOC	0.11	<0.01
DSL-TK2	Diesel Fuel Storage Tank for Fire Pump Engine	VOC	0.02	<0.01
MSS FUG	Inherently Low-Emitting Maintenance Activities (9)	NO_x	<0.01	<0.01
		CO	<0.01	<0.01
		VOC	0.08	<0.01
		PM	0.09	0.02
		PM_{10}	0.09	0.02
		$PM_{2.5}$	0.09	0.02
		NH_3	<0.01	<0.01

(1) Emission point identification - either specific equipment designation or emission point number from plot plan.
(2) Specific point source name. For fugitive sources, use area name or fugitive source name.
(3) NO_x - total oxides of nitrogen
CO - carbon monoxide
VOC - volatile organic compounds as defined in Title 30 Texas Administrative Code (TAC) § 101.1
SO_2 - sulfur dioxide
PM - particulate matter emissions, as defined in Title 30 TAC § 101.1, including PM_{10} and $PM_{2.5}$
PM_{10} - particulate matter emissions equal to or less than 10 microns in diameter, including $PM_{2.5}$
$PM_{2.5}$ - direct particulate matter emissions equal to or less than 2.5 microns in diameter
NH_3 - ammonia
H_2SO_4 - sulfuric acid
$(NH_4)_2SO_4$ - ammonium sulfate
(4) Compliance with annual emission limits (tons per year) is based on a 12-month rolling period.

Emission Sources - Maximum Allowable Emission Rates

(5) Normal operation is defined in Special Condition No. 4.
(6) MSS operation is defined in Special Condition No. 21. For pollutants whose emissions during planned MSS activities are measured using a CEMS, the MSS lbs/hr limits apply during each clock hour that includes one or more minutes of MSS activities. During all other clock hours, the normal lbs/hr limits apply. Annual emission limits include both normal and MSS operation emissions.
(7) $PM/PM_{10}/PM_{2.5}$ includes H_2SO_4 and $(NH_4)_2SO_4$.
(8) Auxiliary boiler hourly and annual limits include both normal and MSS operation emissions.
(9) Fugitive emission rates are estimates and are enforceable through compliance with the applicable special conditions and permit application representations.

Draft Date: February 20, 2015

Special Conditions

Permit Numbers 119365 and PSDTX1410

Emission Rates and Permit Representations

1. This permit authorizes only those sources of emissions listed in the attached tables entitled "Emission Sources - Maximum Allowable Emission Rates" (MAERT), "Attachment A", and "Attachment B" and those sources are limited to the emission limits and other conditions specified on the attached MAERT. This permit authorizes planned maintenance, startup, and shutdown (MSS) activities which comply with the emission limits in the MAERT.

2. Emission limits are based on representations in the permit application dated September 14, 2014, as subsequently updated.

Federal Applicability

3. The sources identified in this condition are subject to and shall comply with applicable requirements of the U.S. Environmental Protection Agency (EPA) regulations in Title 40 Code of Federal Regulations (40 CFR) as follows:

   (A) In 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS):

Source	Emission Point Number (EPN)	Subpart	Standards of Performance for:
Combustion Turbines and Duct Burners	CTDB3-A CTDB3-B	KKKK	Stationary Gas Turbines
Auxiliary Boiler	AUX3	Dc	Industrial-Commercial-Institutional Steam Generating Units
Fire Water Pump Engine	FWP2	IIII	Stationary Compression-Ignition Internal Combustion Engines
Emergency Generator Engine	EG3		
All of the above		A	General Conditions

   (B) In 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (HAP) for Source Categories:

Source	EPN	Subpart	Standards for HAP for:
Fire Water Pump Engine	FWP2	ZZZZ[1]	Stationary Reciprocating Internal Combustion Engines[1]
Emergency Generator Engine	EG3		
Both of the above		A[1]	General Conditions[1]

[1]According to 40 CFR § 63.6590(c)(1), compliance with Part 63 is met by compliance with NSPS Subpart IIII.

Operating Limitations, Performance Standards, and Fuel Specifications

4. This permit authorizes two natural gas-fired combustion turbines (CTs) to operate in combined cycle with heat recovery steam generators (HRSGs) and a steam turbine. Each CT shaft drives an electric generator and each HRSG supplies steam to a single steam turbine which drives an additional electric generator. The CTs may employ evaporative cooling for power enhancement. Each HRSG is equipped with natural gas-fired duct burners. The duct burners in each HRSG are limited to a maximum heat input of 770 million British thermal units (Btu) per hour (MMBtu/hr), based on the high heating value of the fuel. Exhaust emissions are controlled using selective catalytic reduction (SCR) and oxidation catalysts located in the HRSGs.

   A. This permit authorizes construction and operation of two General Electric model 7HA.02 CTs.

   B. The CTs are authorized to operate in normal operation, defined as operation anywhere between and including 45 percent (%) and 100% of full load and the SCR has been placed into operation.

   C. The CTs are authorized to operate at reduced load, defined as operation below 45% of full load that is not MSS operation.

   D. The CTs are authorized for:

      (1) Startup operation, as defined in Special Condition No. 21.A.(1).

      (2) Shutdown operation, as defined in Special Condition No. 21.A.(2).

   E. The CTs are authorized for planned maintenance as described in Attachments A and B, subject to the conditions of this permit and the representations in the permit application.

5. A. The concentration of emissions from each CT/HRSG while operating in normal operation, as defined in Special Condition No. 4.B., shall not exceed the following concentration limits expressed in parts per million by volume dry (ppmvd), at 15% oxygen (O_2).

Concentration Limits for CTs/HRSGs in Normal Operation

Pollutant	Concentration	Averaging time
Nitrogen oxides (NO_x)	2.0	24-hour rolling average
Carbon monoxide (CO)	4.0	3-hour rolling average
Ammonia (NH_3)[1]	10.0	1-hour average
Volatile organic compounds (VOC)[2]	4.0	3-hour average

[1]A 24-hour compliance averaging time for NH_3 applies if a continuous monitoring method is selected under Special Condition No. 17.A. A one-hour average applies if periodic testing is selected under Special Condition No. 17.B.

[2]Defined as total hydrocarbons minus methane and ethane, calculated as methane.

B. The limits in A. of this Special Condition do not apply to a CT/HRSG while operating in reduced load or MSS operation, as described in Special Condition Nos. 4.C, 4.D., and 4.E.

C. The emissions from each CT/HRSG while operating at reduced load, as described in Special Condition No. 4.C., shall be limited as follows.

(1) The CTs must operate in dry low-NO_x mode.

(2) Emissions from the CT/HRSGs must not exceed the pound-per-hour emission limits for normal operations in the MAERT.

6. Except during MSS activities, the opacity shall not exceed five percent averaged over a six-minute period from each stack. During MSS activities, the opacity shall not exceed 15 percent averaged over a six-minute period from each stack. Each determination shall be made by first observing for visible emissions while the emission source is in operation. Observations shall be made at least 15 feet and no more than 0.25 mile from the emission point. If visible emissions are observed from an emission point, then the opacity shall be determined and documented within 24 hours for that emission point using 40 CFR Part 60, Appendix A, Test Method 9. As an alternative to Test Method 9, observed opacity may be assumed to exceed the applicable opacity limit and reported as a deviation following applicable procedures. Contributions from uncombined water shall not be included in determining compliance with this condition. Observations shall be performed and recorded quarterly. If the opacity exceeds five percent during normal operations or 15 percent during MSS activities (or, alternatively, is assumed to exceed the applicable limit), corrective action to eliminate the source of visible emissions shall be taken promptly and documented within one week of first observation.

7. The 2,937-horsepower (hp) emergency generator engine (EPN EG3) and the 250-hp fire water pump engine (EPN FWP2) are each limited to 100 hours of non-emergency operation per year, on a rolling 12-month basis.

8. The auxiliary boiler is subject to the following limitations:

A. Emissions shall not exceed the following concentration limits in ppmvd, at 3% O_2, on a three-hour average, except while operating on hot standby (firing less than 8 MMBtu/hr) and during periods of planned MSS:

Concentration Limits

Pollutant	Limit
NO_x	30
CO	50

B. Heat input is limited to 40 MMBtu/hr, based on the higher heating value of the natural gas.

9. Fuel usage of the permitted facilities is subject to the following.

A. The CTs, duct burners, and auxiliary boiler must use pipeline-quality natural gas containing no more than 2.0 grain (gr) on an hourly basis and 0.5 gr on an annual basis of total sulfur per 100 dry standard cubic feet.

B. The emergency engines must use diesel fuel containing no more than 0.0015 percent sulfur by weight.

C. Firing of any other fuel will require prior authorization from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division.

D. Upon request by the Executive Director of the TCEQ or any local air pollution control program having jurisdiction, the permit holder shall provide a sample and/or an analysis of the fuel fired in the CTs, duct burners, auxiliary boiler, or engines, or shall allow an air pollution control agency representative to obtain a sample for analysis.

10. The aqueous NH_3 storage and delivery system is subject to the following requirements.

A. The permit holder shall maintain loss prevention and protection measures for the storage system. The storage tank area must be marked and protected so as to protect the area from accidents that could cause a rupture.

B. Stored NH_3 must have a concentration of less than 20% NH_3 by weight.

C. All operating practices and procedures relating to the handling and storage of NH_3 shall conform to the safety recommendations specified for that compound by guidelines of the American National Standards Institute.

11. Audio, visual, and olfactory (AVO) checks for NH_3 leaks within the operating area shall be made once a day. Following the detection of a leak, plant personnel shall take one or more of the following actions as soon as practicable:

A. locate and isolate the leak, if necessary;

B. commence repair or replacement of the leaking component; and

C. use a leak collection/containment system to control the leak until repair or replacement can be made if immediate repair is not possible.

Initial Determination of Compliance

12. Sampling ports and platforms shall be incorporated into the design of the exhaust stacks identified as EPNs CTDB3-A, CTDB3-B, and AUX3, according to the specifications set forth in the attachment entitled "Chapter 2, Stack Sampling Facilities." Alternate sampling facility designs may be submitted for approval by the TCEQ Regional Director.

13. The permit holder shall perform stack sampling and other testing as required to establish the actual quantities of air contaminants being emitted into the atmosphere from the CTs and the auxiliary boiler to determine initial compliance with all emission limits established for these facilities. Unless otherwise specified in this Special Condition No. 13, the sampling and testing shall be conducted in accordance with the methods and procedures specified in Special Condition No. 14. The permit holder is responsible for providing sampling and testing facilities and conducting the sampling and testing operations at the holder's expense. The TCEQ Executive Director or his designated representative shall be afforded the opportunity to observe all such sampling.

    A. Air contaminants and diluents from the turbines, EPNs CTDB3-A and CTDB3-B, to be sampled and analyzed include (but are not limited to) NO_x, CO, VOC, sulfur dioxide (SO_2), NH_3, particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), opacity, and O_2.

    B. Each CT shall be tested with duct burners at as close to maximum firing rate as possible while the turbine is operating as close to base load as possible.

    C. Fuel sampling using the methods and procedures of 40 CFR §60.4415(a) may be conducted in lieu of stack sampling for SO_2. If fuel sampling is used, compliance with SO_2 limits shall be based on 100% conversion of the sulfur in the fuel to SO_2.

    D. The auxiliary boiler, EPN AUX3, shall be tested at its maximum firing rate for NO_x, CO, and O_2.

    E. Requests to waive testing for any pollutant specified in this condition shall be submitted to the TCEQ Air Permits Division. Test waivers and alternate or equivalent procedure proposals for NSPS testing which must have the EPA approval shall be submitted to the TCEQ Air Permits Division in Austin.

    F. Sampling as required by this condition shall occur within 60 days after achieving the maximum fuel firing rate at which the turbines and duct burners will be operated, but no later than 180 days after initial startup of each unit. Additional sampling shall occur as may be required by the TCEQ or EPA.

14. A. Sampling shall be conducted in accordance with the appropriate procedures of the TCEQ "Sampling Procedures Manual", and EPA Test Methods in 40 CFR Part 60, Appendix A, 40 CFR 51, Appendix M, and EPA Conditional Test Methods as follows:

(1) Appendix A, Methods 1 though 4, as appropriate, for exhaust flow, diluent, and moisture concentration;

(2) Appendix A, Method 6, 6a, 6c or 8 for the concentration of SO_2;

(3) Appendix A, Methods 7E or 20, or equivalent methods for the concentrations of NO_x and O_2.

(4) Appendix A, Method 9 for opacity (consisting of 30 six-minute readings as provided in 40 CFR §60.11[b]);

(5) Appendix A, Method 10 for the concentration of CO;

(6) Appendix A, Method 19 for applicable calculation methods;

(7) Appendix A, Method 25A, modified to exclude methane and ethane, or Method 18, for the concentration of VOC (to measure total carbon as methane);

(8) EPA Conditional Test Method 27 (CTM-027) for NH_3.

(9) Appendix M, Methods 201A and 202, or Appendix A, Test Method 5, modified to include back half condensibles, for the concentration of PM_{10};

(10) Any variations from those procedures must be approved by the Executive Director of the TCEQ or his designated representative prior to sampling.

B. The TCEQ Houston Regional Office shall be given notice as soon as testing is scheduled but not less than 30 days prior to sampling to schedule a pretest meeting.

(1) The notice shall include:

(a) Date for pretest meeting.
(b) Date sampling will occur.
(c) Name of firm conducting sampling.
(d) Type of sampling equipment to be used.

(e) Method or procedure to be used in sampling, including methods to demonstrate compliance with emission standards found in 40 CFR Part 60, Subpart KKKK.

(f) Procedure used to determine turbine loads during and after the sampling period.

(2) The purpose of the pretest meeting is to review the necessary sampling and testing procedures, to provide the proper data forms for recording pertinent data, and to review the format procedures for submitting the test reports.

(3) Prior to the pretest meeting, a written proposed description of any deviation from sampling procedures specified in permit conditions or TCEQ or EPA sampling procedures shall be made available to the TCEQ. The TCEQ Regional Director shall approve or disapprove of any deviation from specified sampling procedures.

C. Copies of the final sampling report shall be forwarded to the TCEQ and EPA within 60 days after sampling is completed. Sampling reports shall comply with Chapter 14 of the TCEQ Sampling Procedures Manual. The reports shall be distributed as follows:

One copy to the EPA Region 6 Office, Dallas.

Two electronic copies and one paper copy to the TCEQ Houston Regional Office.

Continuous Determination of Compliance

15. The permit holder shall install, calibrate, maintain, and operate a continuous emissions monitoring systems (CEMS) to measure and record the concentrations of NO_x, CO, and diluent (O_2 or carbon dioxide [CO_2]) from each CT/HRSG exhaust stack, EPNs CTDB3-A and CTDB3-B.

A. The NO_x and diluent CEMS shall meet the design and performance specifications, pass the field tests, and meet the installation requirements and the data analysis and reporting requirements specified in the applicable performance specifications in 40 CFR Part 75, Appendices A and B. The requirements of 40 CFR Part 75, Appendices A and B are deemed an acceptable alternative to the performance specifications and quality assurance requirements of 40 CFR Part 60.

B. The CO CEMs shall meet the design and performance specifications, pass the field tests, and meet the installation requirements and the data analysis and reporting requirements specified in the applicable performance specifications

in 40 CFR Part 60, Performance Specification No. 4. The CO CEMS shall meet the applicable quality assurance requirements specified in 40 CFR Part 60, Appendix F, except that cylinder gas audits (CGA) conducted in all four quarters may be used in lieu of the annual relative accuracy test audit. Quarterly CGAs shall be conducted at least 60 days apart. A CGA is not required in any quarter in which the CT operates less than 168 hours. Relative accuracy exceedances (as specified in 40 CFR 60, Appendix F), CGA exceedances of ±15% accuracy, and any CO CEMS downtime shall be reported to the TCEQ Houston Regional Director, and necessary corrective action shall be taken. Supplemental stack sampling may be required at the discretion of the TCEQ Houston Regional Director.

C. The CEMS shall be zeroed and spanned daily, and corrective action taken when the 24-hour span drift exceeds two times the amounts specified in the applicable Performance Specification.

D. For full operating hours, the monitoring data must be reduced to hourly average values at least once every day, using a minimum of four, and normally 60, approximately equally-spaced data points from each one-hour period. For hours in which calibration checks, zero and span adjustments, system breakdowns, or repairs occur, at least two valid data points separated by a minimum of 15 minutes (where the unit operates for more than one quadrant of an hour) will be sufficient to quality-assure the hour.

E. The valid hourly average data from the CEMS shall be averaged over the specified averaging time and the resulting average shall be used to determine compliance with the concentration limits of Special Condition No. 5.A. and in conjunction with the hourly average natural gas fuel consumption data required by Special Condition No. 16, the hourly emission rate limits of the MAERT. Pounds per hour data from each CT/HRSG stack must be summed monthly to tons per year and used to determine compliance with the annual emission limits of the MAERT.

16. The permit holder shall install, calibrate, maintain, and operate a continuous monitoring system to monitor and record the average hourly natural gas consumption of each CT, duct burner, and the auxiliary boiler. The fuel flow meters shall be accurate to ±2.0 percent of the units' maximum flow. The permit holder shall comply with the applicable initial certification and ongoing quality assurance requirements of 40 CFR Part 75, Appendix D for each CT and duct burner.

17. The permit holder shall continuously monitor or periodically measure NH_3 emissions from EPNs CTDB3-A and CTDB3-B when their respective SCR system is in operation. The emission measurements shall be averaged over the specified averaging time and the resulting average shall be used to demonstrate compliance

with the NH_3 limits of Special Condition No. 5.A. and the MAERT. Use of one of the following methods [A.(1), A.(2), A.(3), B., or C.] is required.

A. Continuously monitor or continuously calculate NH_3. Install, calibrate, maintain, and operate a CEMS to measure and record NH_3 directly or calculate NH_3 through the use of a secondary NO_x measurement. The continuously measured or continuously calculated NH_3 concentrations shall be corrected in accordance with Special Condition No. 5.A. Monitor downtime shall not exceed 5 percent of the time that the CTs were operated over the previous 12-month rolling period. Downtime consists of activities involving calibration, unanticipated power failure, unanticipated equipment malfunction, unplanned maintenance and planned maintenance. The continuous options are as follows.

(1) Use a CEMS to directly measure and record the concentration of NH_3. If there are no applicable NH_3 CEMS performance specifications in 40 CFR Part 60, contact the TCEQ Air Permits Division in Austin for requirements to be met.

(2) Use a second NO_x CEMS probe located between the duct burners and the SCR, upstream of the stack NO_x CEMS. In association with the SCR efficiency and NH_3 injection rate, calculate the NH_3 emissions. This condition shall not be construed to set a minimum NO_x reduction efficiency on the SCR unit.

(3) Use a dual stream system of NO_x CEMS at the exit of the SCR. Route one of the exhaust streams, in an unconverted state, to one NO_x CEMS and route the other exhaust stream through a NH_3 converter to convert NH_3 to NO_x and then to the second NO_x CEMS. The NH_3 emission concentration is the difference between the converted and unconverted NO_x CEMS readings.

B. Periodically measure NH_3 emissions.

(1) Use a sorbent or stain tube device specific for NH_3 measurement in the 5 to 10 ppm range. The frequency of sorbent or stain tube testing shall be daily for the first 60 days of operation, after which the frequency may be reduced to weekly, if operating procedures have been developed to prevent excess amounts of NH_3 from being introduced in the SCR unit, and operation of the SCR unit has been proven successful with regard to controlling NH_3 slip. Daily sorbent or stain tube testing shall resume when the catalyst is within 30 days of its useful life expectancy.

(2) If the measured or calculated ammonia slip concentration in B.(1) of this Special Condition exceeds 8 ppm at any time, the permit holder shall begin NH_3 testing by either the Phenol Nitroprusside Method, the

Indophenol Method, or EPA Conditional Test Method (CTM) 27 on a quarterly basis, in addition to the weekly sorbent or stain tube testing. The quarterly testing shall continue until such time as the SCR unit catalyst is replaced; or if the quarterly testing indicates NH_3 slip is 8 ppm or less, the Phenol Nitroprusside/Indophenol/CTM 27 tests may be suspended until sorbent or stain tube testing again indicate 8 ppm NH_3 slip or greater.

C. Any other method used for measuring NH_3 slip shall require prior approval from the TCEQ Regional Office.

18. If any emission monitor fails to meet specified performance, it shall be repaired or replaced as soon as reasonably possible. If the emission monitor is unable to be returned to service within seven days after the failure is detected, the TCEQ Houston Regional Office must be notified. The permit holder shall develop and document in writing, an operation and maintenance program for the continuous monitors, including stocking necessary spare parts to maintain monitor availability.

Maintenance, Startup, and Shutdown (MSS)

19. Attachment A identifies the inherently low emitting (ILE) planned maintenance activities that this permit authorizes to be performed. Attachment B identifies the planned maintenance activities that are non-ILE planned maintenance activities that this permit authorizes to be performed.

20. The permit holder shall minimize emissions during planned MSS activities by operating the facility and associated air pollution control equipment in accordance with good air pollution control practices, safe operating practices, and protection of the facility.

21. Emissions during planned MSS activities will be minimized by limiting the duration of operation in planned MSS modes as follows:

A. CTs/Duct Burners

(1) Planned startup of each CT is defined as the period that begins when the data acquisition and handling system (DAHS) measures fuel flow to the CT and ends when the CT generator (CTG) load reaches 45% and the SCR has been placed into operation. A planned cold startup for each CT is limited to 360 minutes per event. A planned warm startup for each CT is limited to 240 minutes per event. At the conclusion of the startup period (as defined, or the number of minutes, whichever comes first), the permit holder shall comply with the emission concentration

limitations in Special Condition No. 5.A. and the normal operation emission rates in the MAERT.

(2) A planned shutdown of each CT is defined as the period that begins when the CTG output drops below 45% load and ends when there is no longer measurable fuel flow to the CT. A planned shutdown for each CT is limited to 60 minutes per event.

(3) Emissions from CTG optimization activities, as defined in Attachment B, shall be subject to the hourly emission limits for MSS activities from CTs listed on the MAERT. The emissions from such activities shall not exceed the hourly emission limits for normal operation for more than eight hours per calendar day.

(4) In order to limit maximum short-term ambient concentrations of NO_x, the CTs of this permit must not be started up while the CTs, identified as EPNs CTDB1-A, CTDB1-B, CTDB2-A, and CTD2-B, authorized by Permit Nos. 77039/PSDTX1060, are starting up.

B. Auxiliary Boiler

(1) A planned startup is defined as the period that begins when the DAHS detects measurable fuel flow to the boiler and ends when the boiler reaches hot standby or the fuel flow at which the boiler will operate. A planned startup is limited to 120 minutes per event.

(2) A planned shutdown is defined as the period that begins when the boiler drops below the hot standby fuel flow level and ends when no fuel flow is detected. A planned shutdown is limited to 60 minutes per event.

22. Compliance with the emissions limits for planned MSS activities identified in the MAERT attached to this permit shall be demonstrated as follows.

A. For ILE planned maintenance activities identified in Attachment A of this permit:

(1) The total emissions from all ILE planned maintenance activities shall be considered to be no more than the estimated potential to emit for those activities that are represented in the permit application.

(2) The permit holder shall annually confirm the continued validity of the estimated potential to emit represented in the permit application for all ILE planned maintenance activities.

B. For CT and SCR planned MSS activities identified in Attachment B of this permit, the permit holder shall do the following.

(1) For each pollutant whose emissions are measured with a CEMS that has been certified to measure the pollutant's emissions over the entire range of a planned MSS activity, the permit holder shall measure the emissions of the pollutant during the planned MSS activity using the CEMS.

(2) For each pollutant whose emissions are not measured with a CEMS in accordance with B.(1) of this condition, determine for each calendar month the emissions of each pollutant listed on the MAERT of this permit from all occurrences of planned MSS activity by calculation. The calculations of the pollutant's hourly and monthly emissions must use data related to the planned MSS activity, identified in turbine operating records, work orders, or equivalent records. The emission rate of the pollutant during the planned MSS activity must be determined either:

(a) as represented in the permit application; or

(b) as determined with an appropriate method, including but not limited to any of the following methods, provided that the permit holder maintains appropriate records supporting such determination:

i. use of emission factor(s), facility-specific parameter(s), and/or engineering knowledge of the facility's operations;

ii. use of emissions data measured (by a CEMS or during emissions testing) during the same type of planned MSS activity occurring at or on a similar facility, and correlation of that data with the activity's or facility's relevant operating parameters;

iii. use of emissions testing data collected during a planned MSS activity occurring at or on the facility, and correlation of that data with the facility's or activity's relevant operating parameters, such as electric load, temperature, fuel input, or fuel sulfur content;

iv. use of parametric monitoring system data applicable to the facility; or

v. in accordance with an approved Compliance Assurance Monitoring Plan.

Recordkeeping Requirements

23. The following records shall be kept at the plant for the life of the permit. All records required in this permit shall be made available at the request of personnel from the TCEQ, EPA, or any air pollution control agency with jurisdiction.

    A. A copy of this permit.

    B. The permit application dated September 2014 and subsequent representations submitted to the TCEQ.

    C. A complete copy of the testing reports and records of the initial performance testing completed pursuant to Special Condition No. 14 to demonstrate initial compliance.

    D. Stack sampling results or other air emissions testing (other than CEMS data) that may be conducted on units authorized under this permit after the date of issuance of this permit.

24. The following information shall be maintained by the permit holder in a form suitable for inspection for a period of five years after collection and shall be made immediately available upon request to representatives of the TCEQ, EPA, or any local air pollution control program having jurisdiction:

    A. Records necessary to demonstrate compliance with the applicable NSPS identified in Special Condition No. 3.

    B. For pollutants that are monitored by CEMS, hourly records of CT/HRSG emissions and operation to demonstrate compliance with the applicable performance standards of NSPS Subpart KKKK, the concentration limits of Special Condition No. 5, and the hourly and annual emission rates listed in the MAERT, as follows.

        (1) Continuous emission monitoring data for NO_x, CO, diluent gases, O_2 or CO_2, and if applicable, NH_3. Data retention at intervals less than one hour is not required. Records should identify the times when emissions data have been excluded from the calculation of average emission rates because of MSS or malfunction along with the justification for excluding data. Records should also identify factors used in calculations that are used to demonstrate compliance with emission limits and performance standards.

        (2) Hourly average CT and duct burner fuel flow, as specified in Special Condition No. 16, to calculate emissions in lbs/hr.

C. Records of visible emission or opacity observations to demonstrate compliance with Special Condition No. 6.

D. Records of the monthly hours of operation of the emergency engines in emergency and non-emergency operation to demonstrate compliance with Special Condition No. 7.

E. Records of the hours of operation, identifying startup and shutdown periods, and fuel usage of the auxiliary boiler to demonstrate compliance with Special Condition Nos. 8 and 21.B.

F. Fuel purchase records, copies of gas supply contracts, test results, or other information to demonstrate compliance with the CT/HRSG SO_2 emission limits of NSPS Subpart KKKK and fuel sulfur limits of Special Condition No. 9.

G. Records of AVO checks for ammonia leaks and maintenance performed to any piping and valves in NH_3 service to show compliance with Special Condition No. 11. In addition, written records of any accidental releases, spills, or venting of NH_3 and the corrective action taken.

H. Files of all CEMS quality assurance measures, calibration checks, adjustments and maintenance performed on these systems to demonstrate compliance with Special Condition Nos. 15 and 18, and as applicable, Special Condition No. 17.A.

I. As applicable, records of NH_3 emissions sampling and calculations pursuant to Special Condition No. 17.B.

J. Records of dates and times of CT MSS to demonstrate compliance with Special Condition No. 21.

K. Records of monitored or calculated MSS emissions to demonstrate compliance with Special Condition No. 22.

Reporting

25. The permit holder shall submit to the TCEQ Houston Regional Office reports as described in 40 CFR § 60.7 in accordance with NSPS requirements. Such reports are required for each emission unit which is required to be continuously monitored pursuant to this permit. In addition to the information specified in 40 CFR § 60.7(c), each report shall contain:

A. the hours of operation of the CTs; and

B. a report summary of the periods of non-complying emissions and CEMS downtimes by cause.

As-Built Information

26. The permit holder shall submit to the TCEQ Houston Regional Office and the TCEQ Air Permits Division changed pages to the permit application reflective of the final plans and engineering specifications on the CTs/duct burners, auxiliary boiler, emergency engines, and other sources, including their respective control equipment, no later than 30 days before initial start-up of the CTs. This information shall include:

    A. All TCEQ Tables in the permit application, updated with manufacturer and other specified data.

    B. Revised plot plans and equipment drawings necessary to reflect the constructed facility.

    C. Any updates to CT startup information submitted with the application.

27. With the first renewal application for Air Permit No. 77039, due in August, 2015, the permit holder shall submit to the TCEQ Houston Regional Office and the TCEQ Air Permits Division, a permit alteration request to lower the lbs/hr NO_x emission limits applicable to MSS operation for the existing CT/HRSGs, identified as EPNs CTDB1-A, CTDB1-B, CTDB2-A, and CTD2-B, contained in the MAERT of Air Permit Nos. 77039/PSDTX1060. The revised rates must be based on documented, valid, hourly NO_x CEMS and fuel flow data that have occurred for these units during planned MSS operations and/or engineering estimates for additional MSS activities not represented in the CEMS data and may include a reasonable margin to account for variability. Periods of unplanned MSS or upset operation are not included in the permit limit.

28. No later than 30 months after certification of the NO_x and CO CEMS required by this permit, the permit holder shall submit to the TCEQ Houston Regional Office and the TCEQ Air Permits Division, a permit alteration request to lower the lbs/hr NO_x and CO emission limits applicable to MSS operation for the CT/HRSGs, identified as EPNs CTDB3-A and CTDB3-B, contained in the MAERT attached to this permit, to reflect the NO_x and CO emissions in lbs/hr during MSS operation monitored by the CEMS and fuel flow meters. The revised rates must be based on documentation of the highest valid hourly NO_x and CO CEMS and fuel flow data observed during planned MSS operations, and may include a reasonable margin to account for variability. Periods of unplanned MSS or upset operation are not included in the permit limit. Adjustment of the NO_x or CO MSS lbs/hr emission rate will only be required if the maximum valid hourly NO_x or CO lbs/hr emission

rate monitored by the CEMS during MSS operation is 50% or less of the currently permitted value.

Draft Date: February 20, 2015

Attachment A

Permit Nos. 119365 and PSDTX1410

Inherently Low-Emitting Planned Maintenance Activities						
Planned Maintenance Activity	Emissions					
	NO_x	CO	VOC	PM	NH_3	Opacity
Turbine Washing, Unit On-Line[1]				X		
Air Intake Filter Maintenance				X		X
Annual Catalyst Handling and Maintenance[2]				X		
Ammonia Equipment Maintenance[3]					X	
Gaseous fuel venting[4]			X			
Boiler Tube Cleaning			X			
CEMS Calibration	X	X				
Analytical Equipment and Process Instruments			X			

Notes:

[1]Involves use of water only.

[2]Includes but not limited to, replacement, cleaning, activation, and deactivation of SCR and oxidation catalysts.

[3]Includes, but is not limited to:

(i) repair/replacement of pumps, compressors, valves, pipes, flanges, transport lines, filters and screens in NH_3 service; and

(ii) off-line NO_x control device maintenance, including maintenance of the aqueous NH_3 systems associated with the SCR system.

[4]Includes, but is not limited to, venting prior to pipeline pigging, and meter proving.

Draft Date: February 20, 2015

Attachment B

Permit Nos. 119365 and PSDTX1410

Non-Inherently Low Emitting Planned Maintenance Activities							
Planned Maintenance Activity	EPNs	Emissions					
		NO_x	CO	VOC	PM	NH_3	SO_2
CT Maintenance and Tuning[1]	CTDB3-A	X	X	X	X	X	X
SCR Maintenance, Unit On-Line	CTDB3-B	X				X	

Notes:

[1]Includes, but is not limited to:

(i) leak and operability checks (e.g. CT overspeed trip testing, troubleshooting);

(ii) generator balancing; and

(iii) tuning activities that occur during seasonal tuning or after the completion of initial construction, a combustor change-out, a major repair, maintenance to a combustor, or other similar circumstances.

Draft Date: February 20, 2015

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
AIR QUALITY PERMIT

A Permit Is Hereby Issued To
Colorado Bend II Power, LLC
Authorizing the Construction and Operation of the
Colorado Bend II Power Project
Located near **Wharton, Wharton County, Texas** *at*
Latitude 29° 17′ 12″ Longitude −96° 3′ 56″

Permits: 119365 and PSDTX1410

Draft Date : February 20, 2015

Expiration Date: _____ _____
For the Commission

1. **Facilities** covered by this permit shall be constructed and operated as specified in the application for the permit. All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. Variations from these representations shall be unlawful unless the permit holder first makes application to the Texas Commission on Environmental Quality (commission) Executive Director to amend this permit in that regard and such amendment is approved. [Title 30 Texas Administrative Code 116.116 (30 TAC 116.116)]
2. **Voiding of Permit**. A permit or permit amendment is automatically void if the holder fails to begin construction within 18 months of the date of issuance, discontinues construction for more than 18 months prior to completion, or fails to complete construction within a reasonable time. Upon request, the executive director may grant an 18-month extension. Before the extension is granted the permit may be subject to revision based on best available control technology, lowest achievable emission rate, and netting or offsets as applicable. One additional extension of up to 18 months may be granted if the permit holder demonstrates that emissions from the facility will comply with all rules and regulations of the commission, the intent of the Texas Clean Air Act (TCAA), including protection of the public's health and physical property; and (b)(1)the permit holder is a party to litigation not of the permit holder's initiation regarding the issuance of the permit; or (b)(2) the permit holder has spent, or committed to spend, at least 10 percent of the estimated total cost of the project up to a maximum of $5 million. A permit holder granted an extension under subsection (b)(1) of this section may receive one subsequent extension if the permit holder meets the conditions of subsection (b)(2) of this section. [30 TAC 116.120(a), (b) and (c)]
3. **Construction Progress**. Start of construction, construction interruptions exceeding 45 days, and completion of construction shall be reported to the appropriate regional office of the commission not later than 15 working days after occurrence of the event. [30 TAC 116.115(b)(2)(A)]
4. **Start-up Notification**. The appropriate air program regional office shall be notified prior to the commencement of operations of the facilities authorized by the permit in such a manner that a representative of the commission may be present. The permit holder shall provide a separate notification for the commencement of operations for each unit of phased construction, which may involve a series of units commencing operations at different times. Prior to operation of the facilities authorized by the permit, the permit holder shall identify the source or sources of allowances to be utilized for compliance with Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program). [30 TAC 116.115(b)(2)(B)(iii)]
5. **Sampling Requirements**. If sampling is required, the permit holder shall contact the commission's Office of Compliance and Enforcement prior to sampling to obtain the proper data forms and procedures. All sampling and testing procedures must be approved by the executive director and coordinated with the regional representatives of the commission. The permit holder is also responsible for providing sampling facilities and conducting the sampling operations or contracting with an independent sampling consultant. [30 TAC 116.115(b)(2)(C)]

6. **Equivalency of Methods.** The permit holder must demonstrate or otherwise justify the equivalency of emission control methods, sampling or other emission testing methods, and monitoring methods proposed as alternatives to methods indicated in the conditions of the permit. Alternative methods shall be applied for in writing and must be reviewed and approved by the executive director prior to their use in fulfilling any requirements of the permit. [30 TAC 116.115(b)(2)(D)]
7. **Recordkeeping.** The permit holder shall maintain a copy of the permit along with records containing the information and data sufficient to demonstrate compliance with the permit, including production records and operating hours; keep all required records in a file at the plant site. If, however, the facility normally operates unattended, records shall be maintained at the nearest staffed location within Texas specified in the application; make the records available at the request of personnel from the commission or any air pollution control program having jurisdiction; comply with any additional recordkeeping requirements specified in special conditions attached to the permit; and retain information in the file for at least two years following the date that the information or data is obtained. [30 TAC 116.115(b)(2)(E)]
8. **Maximum Allowable Emission Rates**. The total emissions of air contaminants from any of the sources of emissions must not exceed the values stated on the table attached to the permit entitled "Emission Sources--Maximum Allowable Emission Rates." [30 TAC 116.115(b)(2)(F)]
9. **Maintenance of Emission Control**. The permitted facilities shall not be operated unless all air pollution emission capture and abatement equipment is maintained in good working order and operating properly during normal facility operations. The permit holder shall provide notification for upsets and maintenance in accordance with 30 TAC 101.201, 101.211, and 101.221 of this title (relating to Emissions Event Reporting and Recordkeeping Requirements; Scheduled Maintenance, Startup, and Shutdown Reporting and Recordkeeping Requirements; and Operational Requirements). [30 TAC 116.115(b)(2)(G)]
10. **Compliance with Rules**. Acceptance of a permit by an applicant constitutes an acknowledgment and agreement that the permit holder will comply with all rules, regulations, and orders of the commission issued in conformity with the TCAA and the conditions precedent to the granting of the permit. If more than one state or federal rule or regulation or permit condition is applicable, the most stringent limit or condition shall govern and be the standard by which compliance shall be demonstrated. Acceptance includes consent to the entrance of commission employees and agents into the permitted premises at reasonable times to investigate conditions relating to the emission or concentration of air contaminants, including compliance with the permit. [30 TAC 116.115(b)(2)(H)]
11. **This** permit may not be transferred, assigned, or conveyed by the holder except as provided by rule. [30 TAC 116.110(e)]
12. **There** may be additional special conditions attached to a permit upon issuance or modification of the permit. Such conditions in a permit may be more restrictive than the requirements of Title 30 of the Texas Administrative Code. [30 TAC 116.115(c)]
13. **Emissions** from this facility must not cause or contribute to a condition of "air pollution" as defined in Texas Health and Safety Code (THSC) 382.003(3) or violate THSC 382.085. If the executive director determines that such a condition or violation occurs, the holder shall implement additional abatement measures as necessary to control or prevent the condition or violation.
14. **The** permit holder shall comply with all the requirements of this permit. Emissions that exceed the limits of this permit are not authorized and are violations of this permit.

Preliminary Determination Summary

Colorado Bend II Power, LLC
Permit Numbers 119365 and PSDTX1410

I. Applicant

Colorado Bend II Power, LLC (Exelon)
325 North Saint Paul Street, Suite 2650
Dallas, Texas 75201-3920

II. Project Location

The proposed Colorado Bend II Power Project (CB II) is located at the existing Colorado Bend Energy Center (CBEC), 3863 South State Highway 60, near Wharton, Wharton County, Texas 77488.

III. Project Description

Exelon proposes to add additional generation at the CBEC, consisting of combined cycle gas turbines (CCGT) fueled by pipeline quality natural gas. The major equipment comprises two General Electric model Frame 7 HA.02 combustion turbines (CTs) connected to electric generators (CTGs), two supplemental-fired heat recovery steam generators (HRSGs), and one steam turbine electric generator (STG). Each HRSG will use duct burners rated at 770 million Btu per hour of heat input to boost the CT exhaust energy when needed.

Natural gas-fired CCGTs are low-emitting and energy-efficient. Natural gas is the cleanest fossil fuel. The combustion of natural gas produces more water and less particulate matter (PM) and sulfur compounds than heavier fuels. CCGT achieves energy efficiency by combining two thermal cycles. In the Brayton thermal cycle, the CT expands hot, compressed gas over turbine blades which power the CTG. In the Rankine thermal cycle, the exhaust gases from the CT flow through the HRSG, generating pressurized steam; this steam is expanded in the steam turbine, powering the STG.

Each CTG is site-rated at 328 MW gross electric output at 70°F ambient temperature. At this condition, two HRSGs with duct burner firing produce enough steam to generate an additional 501 MW, for a total of 1,157 MW gross, or with about 5% losses, about 1,100 MW net electric output.

The proposed GE F7 HA.02 CT is a new model, advertised as the "world's largest, most efficient gas turbine in its class" by GE.[1] The proposed CBII CTs would be serial numbers 1 and 2 of this 60 Hz version; GE's press release on the proposed CBII project says the CTs are expected to be shipped in 2016. Although a new CT model, the emission-generating combustors will be the existing DLN 2.6+ design. A review of the CCGT ratings in Gas Turbine World (GTW), "2014 Performance Specs"[2] confirms that the GE F7 HA.02 is the largest CT in the 60 Hz market,

[1] Brochure GEA31098 (03/2014), downloaded February 20, 2015 from: http://efficiency.gepower.com/.
[2] Gas Turbine World, January-February Vol. 44 No. 1, Pequot Publishing, Fairfield CT.

although Siemens (S) SCC5-8000H in the 50 Hz market is larger at 400 MW. As shown in Table III-1, this project's plant efficiency, based on net electric output and natural gas lower heating value, are virtually identical to the two next highest offerings for 2x1 CCGTs from other CT manufacturers.

Table III-1: GTW 2014 Performance Specs for 2x1 CCGTs

CT Mfr	Model No.	Output (net MW)		Efficiency (net, LHV)
		per CT	plant	
General Electric	2 x 7HA.02	328	976	61.2%
Mitsubishi	MPCP2(M501J)	322	943	61.7%
Siemens	SCC6-8000H 2x1	274	818	>60.0%
Alstom	KA24-2	231	664	58.4%

In addition to the major equipment, an electric generating facility requires support equipment. Emissions from this equipment are minor. The support equipment includes: an auxiliary steam boiler, a 2,000 kW emergency diesel engine generator, a 250 horsepower emergency diesel engine fire water pump, two small fuel storage tanks for the emergency diesel engines, and a larger tank to hold the aqueous ammonia used for NO_x emission control.

There are several small emission sources associated with the plant, such as the lubricating oil systems for the turbines and generators, and the pipes and valves carrying natural gas and aqueous ammonia.

IV. Emissions

The proposed CB II's maximum annual emissions of federally regulated new source review (FNSR) pollutants subject to review by the Texas Commission on Environmental Quality (TCEQ), in tons per year (tpy), are shown in Table IV-1. These emissions include nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), PM, PM less than 10 microns in average diameter (PM_{10}), PM less than 2.5 microns in average diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and sulfuric acid (H_2SO_4). The pollutants NO_x, CO, PM_{10}, $PM_{2.5}$, and SO_2 are criteria pollutants, for which a national ambient air quality standard (NAAQS) has been promulgated. In addition, NO_x and VOC are regulated as criteria pollutants for the NAAQS pollutant ozone, which forms in the atmosphere as a reaction of NO_x and VOC emissions.

Table IV-1: FNSR pollutants, tpy

NO_x	CO	VOC	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4
375	1,756	360	222	222	222	47	37

The PM_{10} and $PM_{2.5}$ emissions represent size fractions of PM, and are regulated separately with respect to allowable concentrations in the air around the plant. However, because the exhaust PM from CTs and engines is all submicron, with an

average diameter less than 1 x (10^{-6}) meter, 100% of the PM emissions fall in each of the regulated size ranges. The predicted concentrations of these pollutants are discussed in Section VII. The listed PM, PM_{10}, and $PM_{2.5}$ emissions include solid (filterable) and liquid (condensible) material. As a submicron liquid material, the H_2SO_4 emissions are a subset of each of the PM size categories.

The draft permit sets limits for the other pollutants shown in Table IV-2.

Table IV-2: Other air pollutants, tpy

Ammonia NH_3	Ammonium sulfate $(NH_4)_2SO_4$
446	50

Ammonia is used to reduce NO_x emissions from the CTs and duct burners; under some circumstances a small amount of ammonia may "slip" through and be emitted, rather than forming nitrogen and water in reacting with NO_x. When sulfur is present in the natural gas, sulfur oxides are formed upon combustion, and available ammonia reacts with these sulfur oxides to form ammonium sulfate. The ammonium sulfate is a subset of the PM emissions and would be expected to be emitted as solid $PM_{2.5}$.

The emissions from routine maintenance, startup, and shutdown (MSS) activities are part of the permit application and have been reviewed. The maximum allowable emission rate table (MAERT) has separate hourly emission limits for normal and MSS operations for each CT/HRSG. The annual emission limits combine normal and MSS operation emissions into a single limit for each CT/HRSG.

V. Federal Applicability

The United States Environmental Protection Agency (EPA) classifies Wharton County as "unclassifiable/attainment" or "better than national standards" for the criteria pollutants identified in Table IV-1. Because the ambient air in the county where the facility will be located is considered to attain the NAAQS, federal nonattainment permit review does not apply.

The EPA's Prevention of Significant Deterioration (PSD) rules require Exelon to obtain a federal PSD permit. PSD applies to major new or modified sources located in attainment areas. The objective of the PSD permit program for criteria air pollutants is to prevent areas with clean air from degrading to the limit of the NAAQS. A PSD major modification is a project that has the potential to emit a net amount above defined significant rates. These rates include 100 tpy for CO, 40 tpy for NO_x and VOC, 25 tpy for PM, 15 tpy for PM_{10}, 10 tpy for $PM_{2.5}$, and 7 tpy for H_2SO_4. When a project's emissions and the net site increase in emissions are above a particular significant emission rate, PSD permit review is required for that pollutant. As shown in Table IV-1, CB II has proposed emissions above the

significant emission rate for each of the FNSR pollutants. PSD review is required for each of the pollutants in Table IV-1.

Although NH_3, and $(NH_4)_2SO_4$ are not subject to PSD, they are subject to the TCEQ's permit review. Similar to PSD, TCEQ permit review requires both a control technology and an air quality review. This review is documented in the accompanying document, "*Source Analysis & Technical Review*."

VI. Control Technology Review

As part of the best available control technology (BACT) review, the TCEQ evaluates information from the EPA's RACT/BACT/LAER Clearinghouse (RBLC), on-going permitting in Texas and other states, and the TCEQ's continuing review of emissions control developments.

A. Combined Cycle Combustion Turbines

NO_x Emissions

NO_x emissions from CTs are generated through the oxidation of nitrogen in the high temperature combustion zones. The applicant proposes to use dry, low-NO_x (lean premix) combustors in the CTs, low-NO_x burners in the HRSGs, and selective catalytic reduction (SCR) post-combustion to control NO_x emissions to 2.0 parts per million by volume, dry (ppmvd) at 15 percent oxygen (% O_2), on a rolling 24-hour average. This limit is Tier I BACT, according to the TCEQ's Gas Turbine BACT Requirements Table. Searches of the EPA's RACT-BACT-LAER (RBLC) Clearinghouse for gas-fired CCGTs were conducted by the applicant and the TCEQ permit reviewer. The lowest emission limits in the RBLC are based on the combination of lean premix combustors and SCR; the lowest emission limit is 2.0 ppmvd. The use of lean premix combustors and SCR to control NO_x emissions to 2.0 ppmvd is consistent with the top level of control for CTs; therefore, the proposed limit represents BACT.

CO Emissions

CO emissions result from incomplete combustion of carbon in the fuel. The premixing of air and fuel in the proposed lean premix combustors produces not only low NO_x, but also efficient combustion and low CO emissions. For additional CO reduction, the applicant proposes to use oxidation catalyst. Although the catalyst will be capable of reducing CO emissions during steady load operation, typically under these conditions the lean premix combustors will produce very little CO and the catalyst will have limited practical benefit. However, during rapid load changes, lean premix control alone may result in CO emission "spikes" that oxidation catalyst will control. The proposed CTs are being designed to operate in compliance with the NOx emission limits between 45% and 100% of the load range. At lower loads, there is more potential for CO to increase.

A search of the RBLC shows that the combination of lean premix and oxidation catalyst is the most effective technology available for CO control. Permitted CO emission limits for CCGT EGFs since 2007 range from 0.9 to 25 ppmvd at 15% O_2, with the majority at 2.0 ppmvd. The applicant's proposed emission limit of 4.0 ppmvd at 15% O_2 over normal operation is higher than some other recent permits, but still consistent with the recent permits for Southern Power's Trinidad Facility, and Calpine's Channel and Deer Park Energy Centers. The proposed 4.0 ppmvd limit is acceptably BACT, given the use of oxidation catalyst and the consistency with the TCEQ's BACT requirements table.

VOC Emissions

VOC emissions result from incomplete combustion of carbon in the fuel. A review of the RBLC shows that the applicant's proposed use of efficient lean premix combustors and oxidation catalyst is the most effective control technology for VOC emissions. The applicant's proposed emission limit of 4.0 ppmvd, at 15% O_2 equals the TCEQ's BACT Requirements Table for CCGTs with duct burners. A search of the RBLC for CCGTs permitted since 2007 shows VOC emission limits from 0.3 ppmvd to 5 ppmvd, corrected to 15% O_2. The applicant's proposed emission limit of 4.0 ppmvd at 15% O_2 over normal operation is higher than some other recent permits, but still consistent with the recent permit for Southern Power's Trinidad Facility. The proposed 4.0 ppmvd limit is acceptably BACT, given the consistency with the TCEQ's BACT requirements table.

$PM/PM_{10}/PM_{2.5}$ Emissions

$PM/PM_{10}/PM_{2.5}$ is emitted from combustion processes as a result of the presence of inorganic constituents in the fuel, PM in the inlet air, and incomplete combustion of the organic constituents in the fuel. For natural gas fuel, the size of this PM is less than one micron, according to the EPA document, "AP-42". Natural gas contains almost no inorganic compounds or liquid hydrocarbons, so the $PM_{2.5}$ emissions will primarily be the result of incomplete combustion and are relatively low. A search of the RBLC database shows that no add-on controls are required for natural gas-fired CTs to control $PM/PM_{10}/PM_{2.5}$. Therefore, the use of pipeline-quality natural gas and the application of good combustion controls is BACT for $PM/PM_{10}/PM_{2.5}$.

SO_2 and H_2SO_4 Emissions

Emissions of SO_2 and H_2SO_4 may occur as a result of oxidation of sulfur in the natural gas fired in the CTs and duct burners. The majority of the sulfur converts to SO_2; a portion of the SO_2 will be further converted to H_2SO_4 and $(NH_4)_2SO_4$, with a conversion contribution due to the action of the SCR. The formation of SO_2, H_2SO_4, and $(NH_4)_2SO_4$ will be minimized by using pipeline-quality natural gas with a sulfur content not to exceed 2.0 grains sulfur per 100 standard cubic feet on the short term and 0.50 grain sulfur per 100 standard cubic feet on an annual average. A search of the RBLC for did not show any post-combustion SO_2 or H_2SO_4 control technologies applied to CTs. The RBLC showed that limitation

on the fuel sulfur content has been accepted as BACT for SO_2 and H_2SO_4. Therefore, the use of pipeline-quality natural gas is BACT for SO_2 and H_2SO_4.

Maintenance, Startup and Shutdown (MSS) Emissions

Startup and shutdown of the CTs is a necessary operation. Emissions during startup are higher than during normal operation because the CT combustion system is not as efficient as during steady state operation and there is a warm-up time before achieving the minimum temperatures needed by the emission control systems. During shutdown, as the firing rate decreases, there is a brief time before combustion ends that the necessary operating temperatures of the emission controls are no longer achieved. Startup and shutdown emissions from the CTs will be minimized by minimizing the duration of startups and shutdowns and operating the SCR emission controls as soon as practicable during a startup and for as long as possible during a shutdown.

The proposed CT startup emissions are higher than some recent permits. Conditions within the CT and downstream to the catalytic control devices are highly transient during startup. Ambient conditions (temperature, humidity and pressure), CT component temperatures, and fuel quality (heating value) are variables which influence CT emissions. The uncertainty arising from the new CT design and its integration with the HRSG and other plant components is greater during these inherently variable startup conditions than at any other time. The proposed hourly startup and shutdown emission limits are based on information from the CT, HRSG, and steam turbine vendors, and the company's engineer, Black & Veatch. In order to address the concern that too much margin has been built into the CT MSS representations, Special Condition No. 28 requires Exelon to lower NO_x or CO emissions if the data from the CEMS and fuel flow meters indicate that emissions are less than half the permitted MSS rates.

The end of CT startup is defined in Special Condition No. 21.A.(1) as the time at which the CTG load reaches 45% and the SCR has been placed into operation, not to exceed six hours for a cold startup, four hours for a warm startup, and three hours for a hot startup. Each shutdown is limited to one hour. Emissions during startup and shutdown are subject to hourly and annual emission limits on the MAERT. The annual emissions are limited by calculating startup and shutdown emissions based on 301 hours per year each of startup and shutdown, representing approximately 118 starts per year.

Maintenance of the CTs includes a number of optimization activities that must be conducted while the CTs operate, sometimes under transient or reduced load, or similar circumstances where the emission controls are not fully operational. Emissions from CT maintenance are subject to the hourly emission limits for MSS and are restricted to no more than eight hours per day at these higher rates. The annual CT/HRSG emission limits of the MAERT apply to maintenance emissions. Because CT maintenance is not conducted frequently, annual

emissions were not increased to account for maintenance. BACT is achieved by minimizing the duration of higher emission rates due to maintenance activities.

B. Auxiliary Boiler

The proposed natural gas-fired auxiliary boiler is proposed to be controlled with low-NO_x burners to meet a NO_x emission limit of 30 ppmvd at 3% O_2. Given the relatively small size of the boiler, rated 40 MMBtu/hr heat input, this limit is consistent with the TCEQ's Tier 1 guidance for BACT. The 30 ppm NOx limit is consistent with BACT findings for some similar-sized and larger natural gas-fired auxiliary boiler listed in the RBLC. One recent example, the Troutdale Energy Center air permit, issued March 2014, is reported to use an auxiliary boiler with a design 40 MMBtu/hr heat input, and is also permitted at 30 ppm NO_x (RBLC ID #OR-0050). BACT is applied.

The draft permit requires a CO concentration limit of 50 ppmvd at 3% O_2. Emissions of CO, VOC, and PM will be minimized though the use of efficient burners, good combustion practices, and pipeline quality natural gas. The limit and techniques meet BACT.

C. Cooling Tower

In September, 2014, Exelon revised their permit application to use an air-cooled condenser (dry cooling tower). Because of this, the cooling tower will not be a source of emissions.

D. Emergency Engines

The emergency diesel generator and fire water pump engines will be new equipment which must comply with the federal Standards of Performance for New Stationary Sources, Subpart IIII. Subpart IIII, in Title 40 Code of Federal Regulations (40 CFR) § 60.4202, requires the manufacturer of the 2,000 kW emergency generator engine to certify the engine to meet the transitional Tier 3 non-road emission standards of 40 CFR § 89.112. The 250 horsepower (187 kW) fire water pump engine manufacturer must certify the engine to what equates to the Tier 3 non-road emission standard in 40 CFR § 89.112. Each engine is limited to 100 hours per year of non-emergency operation. The development by EPA of emission standards applicable nationwide to emergency diesel engines has resulted in consistent and lower emission limits for these stationary sources. Additional controls for these engines would not be economically reasonable, given the very low hours of operation allowed.

E. Other Emission Sources

VOC Emission Sources

The permit authorizes diesel fuel oil storage tanks for the two emergency engines. The emissions of diesel vapors from these tanks are negligible because the vapor pressure of diesel fuel is less than 0.01 pound per square inch. The applicant proposes submerged loading for these sources, which is BACT.

Natural gas emissions from pipe fittings or other components in natural gas service and fuel line purges of natural gas during maintenance, startup, and shutdown (MSS) activities account for a very small amount of additional VOC emissions, 0.2 tpy. Based on the small amount of annual emissions no additional control, such as a leak detection and repair program is required to meet BACT.

The CTs and steam turbine require bearing lubrication systems, which have vents open to the atmosphere. The emissions from these vents are very small, 0.03 tpy, and are controlled by oil mist eliminators to meet BACT.

Maintenance Emissions other than from the CT/HRSG Stacks

In addition to maintenance to optimize CT performance discussed previously, the permit authorizes a number of maintenance activities that are likely to be required at the site. Attachment A of the special conditions identifies these activities; the MAERT limits the total emissions from these activities. The emissions are negligible, at a combined total of less than 0.05 ton per year. Special Condition No. 22 requires that annual evaluations be conducted to assure ongoing compliance with the emission limits in the MAERT. The representations in the permit application and compliance with the permit conditions constitute BACT for these sources.

VII. Air Quality Analysis

The air quality analysis (AQA) is acceptable for all review types and pollutants. The results are summarized below.

A. De Minimis Analysis

A De Minimis analysis was initially conducted to determine if a full impacts analysis would be required. The De Minimis analysis modeling results indicate that NO_2, CO, $PM_{2.5}$ (NAAQS), $PM_{2.5}$ (Increment), 24-hr PM_{10}, and 1-hr SO_2 exceed the respective de minimis concentrations and require a full impacts analysis. The De Minimis analysis modeling results for annual PM_{10} and 3-hr, 24-hr, and annual SO_2 indicate that the project is below the respective de minimis concentrations and no further analysis is required.

The justification for selecting the EPA's interim 1-hr NO_2 and 1-hr SO_2 De Minimis levels was based on the assumptions underlying EPA's development of the 1-hr NO_2 and 1-hr SO_2 De Minimis levels. As explained in EPA guidance memoranda[3,4], the EPA believes it is reasonable as an interim approach to use a De Minimis level that represents 4% of the 1-hr NO_2 and 1-hr SO_2 NAAQS.

[3] www.epa.gov/region07/air/nsr/nsrmemos/appws02.pdf
[4] www.epa.gov/nsr/documents/20100629no2guidance.pdf

The applicant provided an evaluation of ambient $PM_{2.5}$ monitoring data, consistent with EPA guidance for $PM_{2.5}$[5], for using the $PM_{2.5}$ De Minimis levels in the NAAQS analysis. If monitoring data shows that the difference between the $PM_{2.5}$ NAAQS and the monitored $PM_{2.5}$ background concentrations is greater than the $PM_{2.5}$ De Minimis level, then the proposed project with predicted impacts below the $PM_{2.5}$ De Minimis level would not cause or contribute to a violation of the $PM_{2.5}$ NAAQS and does not require full impacts modeling. See the discussion below in the Air Quality Monitoring section for additional information on the evaluation of ambient $PM_{2.5}$ monitoring data.

The applicant also provided an analysis to justify using the $PM_{2.5}$ De Minimis levels for the PSD Increment analysis. See the discussion below in the Increment Analysis section for additional information.

While the De Minimis levels for both the NAAQS and increment are identical for $PM_{2.5}$ in the table below, the procedures to determine significance (that is, predicted concentrations to compare to the De Minimis levels) are different. This difference occurs because the NAAQS for $PM_{2.5}$ are statistically-based, but the corresponding increments are exceedance-based.

Table 1. Modeling Results for PSD De Minimis Analysis in Micrograms Per Cubic Meter (µg/m³)

Pollutant	Averaging Time	GLCmax (µg/m³)	De Minimis (µg/m³)
SO_2	1-hr	8.8	7.8
SO_2	3-hr	9	25
SO_2	24-hr	4.6	5
SO_2	Annual	0.1	1
PM_{10}	24-hr	8.9	5
PM_{10}	Annual	0.54	1
$PM_{2.5}$ (NAAQS)	24-hr	6.5	1.2
$PM_{2.5}$ (NAAQS)	Annual	0.48	0.3
$PM_{2.5}$ (Increment)	24-hr	8.9	1.2
$PM_{2.5}$ (Increment)	Annual	0.54	0.3
NO_2	1-hr	115	7.5
NO_2	Annual	1.1	1
CO	1-hr	5317	2000

[5] www.epa.gov/ttn/scram/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf

Pollutant	Averaging Time	GLCmax (µg/m³)	De Minimis (µg/m³)
CO	8-hr	1118	500

The 1-hr NO_2 and 1-hr SO_2 GLCmax are the highest five-year averages of the maximum predicted 1-hr concentrations determined for each receptor across five years of meteorological data.

The 24-hr $PM_{2.5}$ (NAAQS) GLCmax is the highest five-year average of the maximum predicted 24-hr concentrations determined for each receptor across five years of meteorological data. The annual $PM_{2.5}$ (NAAQS) GLCmax is the highest five-year average of the predicted annual concentrations determined for each receptor across five years of meteorological data.

The GLCmax for all other pollutants and averaging times are the maximum predicted concentrations associated with five years of meteorological data.

B. Air Quality Monitoring

The De Minimis analysis modeling results indicate that 8-hr CO exceeds the monitoring significance level and requires the gathering of ambient monitoring information.

The De Minimis analysis modeling results indicate that 24-hr SO_2, 24-hr PM_{10}, and annual NO_2 are below their respective monitoring significance levels.

Table 2. Modeling Results for PSD Monitoring Significance Levels

Pollutant	Averaging Time	GLCmax (µg/m³)	Significance (µg/m³)
SO_2	24-hr	4.6	13
PM_{10}	24-hr	8.9	10
NO_2	Annual	1.1	14
CO	8-hr	1118	575

The GLCmax are the maximum predicted concentrations associated with five years of meteorological data.

The applicant evaluated ambient CO and $PM_{2.5}$ monitoring data to satisfy the requirements for the pre-application air quality analysis.

Background concentrations for $PM_{2.5}$ were obtained from the EPA AIRS monitor 481490001 located at 636 Roznov Rd., Round Top, Fayette County. The three-year average (2012-2014) of the 98th percentile of the annual distribution of the 24-hr concentrations was used for the 24-hr value (20 µg/m3). The three-year average (2012-2014) of the annual mean concentrations was used for the annual value (8 µg/m3). This monitor is reasonable based on the applicant's quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

Background concentrations for CO were obtained from the EPA AIRS monitor 482011035 located at 9525 1/2 Clinton Dr., Houston, Harris County. The second highest 1-hr concentration from the most recent year of data (2014) was used for the 1-hr value (1830 µg/m3). The second highest 8-hr concentration from the most recent year of data (2014) was used for the 8-hr value (1287 µg/m3). The use of this monitor is reasonable based on the applicant's quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

The $PM_{2.5}$ and CO monitoring data were also used as background concentrations in the NAAQS analysis.

C. National Ambient Air Quality Standards (NAAQS) Analysis

The De Minimis analysis modeling results indicate that NO_2, CO, $PM_{2.5}$, 24-hr PM_{10}, and 1-hr SO_2 exceed the respective de minimis concentrations and require a full impacts analysis. The full NAAQS modeling results indicate the total predicted concentrations will not result in an exceedance of the NAAQS.

Table 3. Total Concentrations for PSD NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax (µg/m3)	Background (µg/m3)	Total Conc. = [Background + GLCmax] (µg/m3)	Standard (µg/m3)
SO_2	1-hr	81	26	107	196
PM_{10}	24-hr	11	49	60	150
$PM_{2.5}$	24-hr	7	20	27	35
$PM_{2.5}$	Annual	1.8	8	9.8	12
NO_2	1-hr	145	26	171	188
NO_2	Annual	3	5	8	100
CO	1-hr	5160	1830	6990	40000
CO	8-hr	1119	1287	2406	10000

The 1-hr SO_2 GLCmax is the highest five-year average of the 99th percentile, or high, fourth high (H4H), of the annual distribution of the maximum daily 1-hr predicted concentrations determined for each receptor.

The PM_{10} GLCmax is the maximum high, sixth-high (H6H) predicted concentration associated with five years of meteorological data.

The 24-hr $PM_{2.5}$ GLCmax is the highest five-year average of the 98th percentile, or high, eighth high (H8H), of the annual distribution of the maximum predicted 24-hr concentrations determined for each receptor. The annual $PM_{2.5}$ GLCmax is the highest five-year average of the predicted annual concentrations determined for each receptor.

The 1-hr NO_2 GLCmax is the highest five-year average of the 98th percentile, or H8H, of the annual distribution of the predicted daily maximum 1-hr concentrations determined for each receptor. The annual NO_2 GLCmax is the maximum predicted concentration associated with five years of meteorological data.

The CO GLCmax are the maximum high, second high (H2H) predicted concentrations associated with five years of meteorological data.

A background concentration for 1-hr SO_2 was obtained from the EPA AIRS monitor 482011050 located at 4522 Park Rd., Seabrook, Harris County. The applicant used the three-year average (2012-2014) of the 99th percentile of the annual distribution of the daily maximum 1-hr concentrations for the 1-hr value.

A background concentration for PM_{10} was obtained from the EPA AIRS monitor 482011039 located at 4514 1/2 Durant St., Deer Park, Harris County. The second highest 24-hr concentration from three years of data (2011-2013) was used for the 24-hr value.

Background concentrations for $PM_{2.5}$ were obtained from the EPA AIRS monitor 481490001 located at 636 Roznov Rd., Round Top, Fayette County. The three-year average (2012-2014) of the 98th percentile of the annual distribution of the 24-hr concentrations was used for the 24-hr value. The three-year average (2012-2014) of the annual mean concentrations was used for the annual value.

Background concentrations for NO_2 were obtained from the EPA AIRS monitor 480390618 located at FM 1459 and County Road 924, Danciger, Brazoria County. The three-year average (2012-2014) of the 98th percentile of the annual distribution of the daily maximum 1-hr concentrations was used for the 1-hr value. The annual concentration from most recent year (2014) was used for the annual value.

Background concentrations for CO were obtained from the EPA AIRS monitor 482011035 located at 9525 1/2 Clinton Dr., Houston, Harris

County. The second highest 1-hr concentration from the most recent year of data (2014) was used for the 1-hr value. The second highest 8-hr concentration from the most recent year of data (2014) was used for the 8-hr value.

The use of above monitors is reasonable based on the applicant's quantitative review of emissions sources in the surrounding area of the monitor site relative to the project site.

The applicant provided an evaluation of secondary $PM_{2.5}$ impacts that considers modeling results of the directly emitted $PM_{2.5}$ emissions, ambient background monitoring data representative for the project site, and proposed allowable emission rates of SO_2 and NO_x:

- Adding the modeling results from the directly emitted $PM_{2.5}$ emissions to representative background concentrations gives total concentrations well below the NAAQS.
- The proposed emissions of SO_2 and NO_x are greater than the SO_2 and NO_x significant emission rates SERs (40 tpy). Secondary $PM_{2.5}$ formation occurs as a result of chemical transformations that occur in the atmosphere gradually over time and only a portion of the SO_2 and NO_x emissions would be affected. Furthermore, secondary $PM_{2.5}$ formation from SO_2 and NO_x are unlikely to overlap in space or time with nearby maximum primary $PM_{2.5}$ impacts associated with the project sources.
- The applicant considered the potential contribution of secondary $PM_{2.5}$ from the proposed precursor emissions for the proposed project with a comparison to existing regional $PM_{2.5}$ precursor emissions based on 2011 National Emissions Inventory database (NEI) and determined that the precursor emissions from the project (575 tpy) are a small percentage of the precursor emissions from the region air shed (116,232 tons).
- In addition, only a portion of the proposed SO_2 and NO_x emissions would be expected to convert to secondary $PM_{2.5}$ in the form of ammonium sulfate and ammonium nitrate. The applicant reviewed $PM_{2.5}$ speciated monitoring data from a nearby monitor (EPA AIRS monitor 482011039 located at 4514 1/2 Durant St., Deer Park, Harris County) to provide an estimate for the potential secondary $PM_{2.5}$ sulfate and nitrate concentrations associated with the proposed project. Based on the monitoring information, the applicant determined that the total sulfate and nitrate are a small fraction of the total $PM_{2.5}$.

Based on this analysis, the applicant determined that the secondary $PM_{2.5}$ formation due to the project NO_x and SO_2 emissions is not expected to be significant.

Table 4. PSD Ambient Air Quality Analysis for Ozone

Pollutant	Monitor	Averaging Time	Background (ppb)	Standard (ppb)
O_3	480390618	8-hr	69	75

A background concentration for ozone was obtained from the EPA AIRS monitor 480390618 located at FM 1459 and County Road 924, Danciger, Brazoria County. A three-year average (2012-2014) of the annual fourth highest daily maximum 8-hr concentrations was used in the analysis. The use of this monitor for a background concentration of ozone is reasonable since it is the closest ozone monitor to the project site and the emissions in the surrounding area of the monitor site are similar to the project site.

EPA Region 6 has previously recommended a conservative analysis based on the NO_x modeling to estimate the potential impacts on ozone levels. Considering that it takes time for NO_2 to react to generate ozone, an evaluation of maximum estimated NO_2 concentrations at a distance of 10-to-11 kilometers (km) downwind from the project source could be used to estimate the potential ozone impacts. EPA Region 6 has recommended that emission sources would have an average ozone yield of up to 2-3 ozone molecules per NO_2 molecule. The applicant used AERMOD to calculate a maximum 8-hr NO_x concentration of 1.09 parts per billion (ppb) at a distance of 10 km. Assuming 90% conversion of NO_x to NO_2 and an ozone yield of three ozone molecules per molecule of NO_2, the 8-hr maximum predicted increase of ozone would be 3.27 ppb. Adding 3.27 ppb to the 8-hr ozone background will result in a total 8-hr ozone concentration less than the 8-hr ozone NAAQS of 75 ppb.

D. Increment Analysis

The De Minimis analysis modeling results indicate that $PM_{2.5}$, 24-hr PM_{10}, and annual NO_2 exceed the respective de minimis concentrations and require a full PSD increment analysis.

Table 5. Results for PSD Increment Analysis

Pollutant	Averaging Time	GLCmax (µg/m³)	Increment (µg/m³)
PM_{10}	24-hr	13	30
$PM_{2.5}$	24-hr	8.4	9
$PM_{2.5}$	Annual	0.7	4
NO_2	Annual	3	25

The GLCmax for 24-hr PM_{10} and 24-hr $PM_{2.5}$ are the maximum H2H predicted concentrations across five years of meteorological data. The GLCmax for annual $PM_{2.5}$ and annual NO_2 are the maximum predicted annual concentrations across five years of meteorological data.

The applicant provided an analysis to justify using the $PM_{2.5}$ De Minimis levels for the PSD Increment analysis that considers the contribution from the project sources to the GLCmax, the decrease of predicted concentrations with distance from the project sources, and the magnitude of emissions and the location of nearby increment-affecting sources:

- The contribution from the project sources to the GLCmax for the 24-hr averaging period is approximately 90%. The contribution from the project sources to the GLCmax of the annual averaging period is approximately 75%.

- Based on the De Minimis analysis, the location of the GLCmax for 24-hr and annual $PM_{2.5}$ occurred at a distance of 0.7 km from the project sources. The concentrations dropped with distance from the project sources and are less than half the De Minimis value at 9 km (24-hr) and 3.5 km (annual).

- The emissions from the increment-affecting sources located within 15 km of the project site are lower relative to the emissions from the project sources.

Based on this analysis, the applicant determined that it is appropriate to limit the full PSD Increment analysis to the significant receptors only; this is reasonable.

E. 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 primary and secondary NAAQS. The applicant meets the Class II visibility analysis requirement by complying with the opacity requirements of 30 TAC 111. The Additional Impacts Analyses are reasonable and possible adverse impacts from this project are not expected.

The ADMT evaluated predicted concentrations from the project site to determine if emissions could adversely affect a Class I area. The nearest Class I area, Caney Creek Wilderness, is located approximately 595 km from the project site towards the northeast.

The H_2SO_4 24-hr maximum predicted concentration of 2.97 µg/m³ occurred approximately 550 meters from the property line towards the north. 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 Caney Creek Wilderness Class I area is 0.02 µg/m³. The Caney Creek Wilderness Class I area is an additional 545 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 Caney Creek Wilderness 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 30 km from the proposed sources in the direction of the Caney Creek Wilderness Class I area. The Caney Creek Wilderness Class I area is an additional 565 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 Caney Creek Wilderness Class I area.

F. Minor Source NSR and Air Toxics Review

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

Pollutant	Averaging Time	GLCmax (µg/m³)	Standard (µg/m³)
SO_2	1-hr	103	1021
H_2SO_4	1-hr	8.4	50
H_2SO_4	24-hr	3	15

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

Pollutant & CAS#	Averaging Time	GLCmax (µg/m³)	ESL (µg/m³)
Ammonia 7664-41-7	1-hr	72	170
Ammonium sulfate 7783-20-2	Annual	11	50

The GLCmax are located along the property line.

VIII. Conclusion

Exelon proposes controls and emission limits that represent BACT for the proposed electric generating facility. Modeling analysis indicates that the proposed project will not violate the NAAQS or any PSD increment, nor have any adverse impacts on the public health, soils, vegetation, or any Class I area. In addition, the modeling predicts that none of the pollutants will exceed their respective ESLs for non-criteria contaminants. The applicant has demonstrated the project meets all applicable rules, regulations and requirements of the Texas and Federal Clean Air Acts. The executive director's preliminary decision is to issue Permit Nos. 119365 and PSDTX1410.